Chapter Six – Preferred Concept Plan Conditions

6.0 INTRODUCTION

The Preferred Concept Plan is made up of several traffic calming elements intended to slow traffic along University Avenue, making it a more pedestrian friendly and safer corridor to travel. This chapter focuses on the elements of the Preferred Concept Plan and how they affect each mode of transportation.

It also presents the results of the VISSIM microsimulation model operational analysis of the corridor. The measures of effectiveness that describe the operating conditions of the corridor with the elements of the Preferred Concept Plan in place are summarized at the end of this chapter.

6.1 ELEMENTS OF THE CONCEPT PLAN AFFECTING TRAFFIC

In this report, the term "traffic" refers to vehicles traversing the corridor that are not transit vehicles. This includes passenger vehicles, delivery trucks, school buses, semi-truck and trailer units, trash trucks, etc. These vehicles carry goods and people into and out of the study corridor. Currently four lanes are provided along most of University Avenue for traffic, with the exception of the segments between Idaho Street and Iowa Street where only one lane in the westbound direction is provided. Traffic shares the roadway with transit vehicles and bicycles.

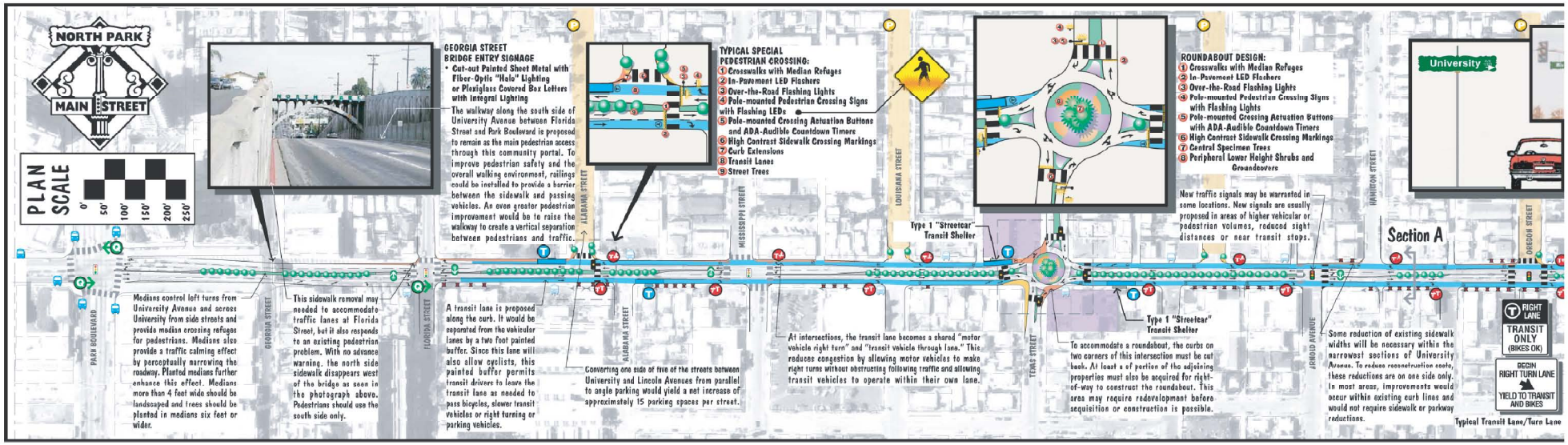
The Preferred Concept Plan, as drafted for the University Avenue Traffic Calming project by KTU+A, is provided in Exhibit 6-1. Elements of the Preferred Concept Plan that will affect the flow of traffic through the corridor are:

- Constrained Capacity due to Transit Only Lanes
- On-Street Parking between Idaho Street and Iowa Street
- Roundabout at Texas Street
- Raised Median
- Spacing of Traffic Signals

Transit Only Lanes

As proposed, the outside or curb lane along University Avenue would serve as a dedicated transit only lane through much of the corridor. The number of lanes on University Avenue available to traffic would therefore be reduced by 50 percent through most of the corridor to allow for this transit only lane.

Dedicated turn lanes and the raised median would improve the flow of traffic along the corridor; therefore the daily capacity of University Avenue would remain unchanged at 15,000 vehicles per day. The greatest impact to traffic would occur during the peak hours. Based on daily traffic volume counts collected along University Avenue, the a.m. peak hour traffic volumes account for approximately six



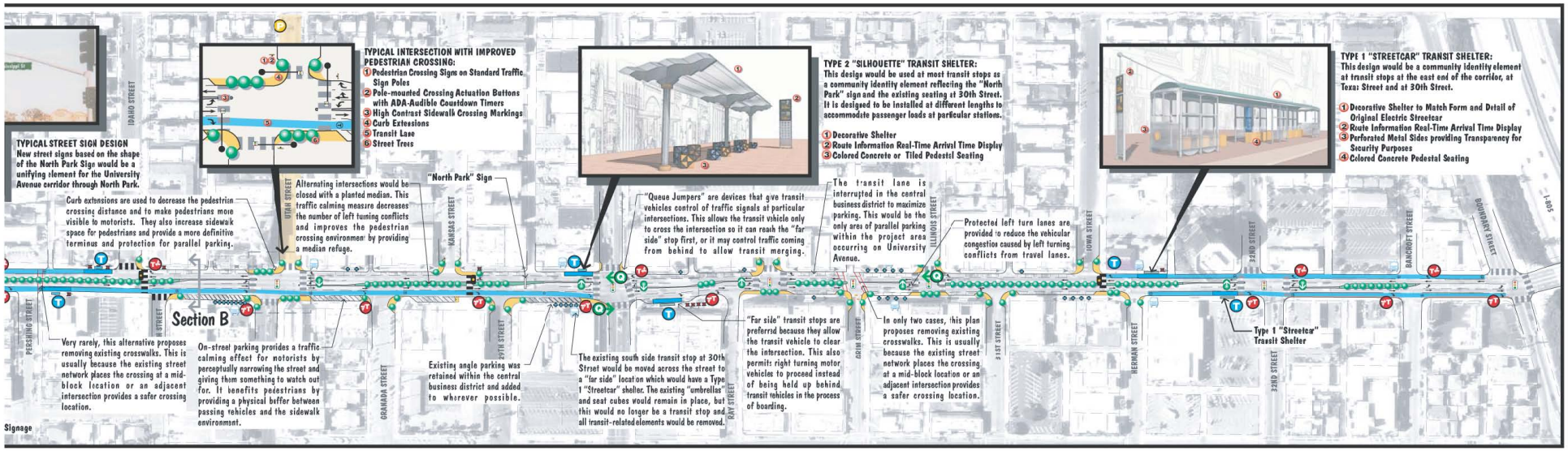
Source: "University Avenue Traffic Calming Conceptual Study, November 2002, KTU+A

PREFERRED CONCEPT PLAN

EXHIBIT 6-1

PREFERRED ALTERNATIVE A

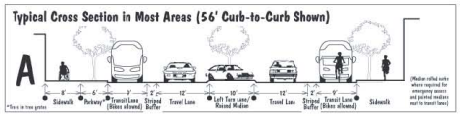
UNIVERSITY AVENUE • NORTH PARK • TRAFFIC CALMING

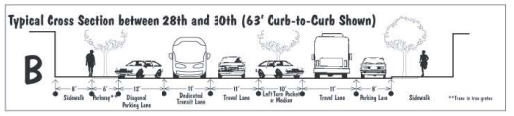


SUMMARY

5 Lane Option - 1 Unobstructed Vehicular Lane Each Way with Protected Left Turn Pockets and Medians for increased control of crossing traffic and elimination or unprotected and uncontrolled left turns from travel lanes, with Transit Lanes Each Way except within CBD: Install dedicated transit lanes striped separate from vehicular lanes throughout except for within CBD.

SECTIONS





Source: "University Avenue Traffic Calming Conceptual Study, November 2002, KTU+A

PREFERRED CONCEPT PLAN

percent of the total daily traffic and the p.m. peak hour traffic volumes account for approximately nine percent of the total daily traffic.

During the peak hour, each lane along University Avenue carries approximately 530 vehicles per hour. Existing traffic volumes along the corridor show that on the average between Boundary Street and Park Boulevard:

- 400 vehicles travel eastbound in the a.m. peak hour
- 650 vehicles travel westbound in the a.m. peak hour
- 980 vehicles travel eastbound in the p.m. peak hour
- 660 vehicles travel westbound in the p.m. peak hour

Based on the peak hour capacity threshold of 850 vehicles per lane per hour, existing traffic volumes exceed the theoretical capacity of a single lane in the eastbound direction during the p.m. peak hour. The methodology for establishing this threshold is discussed in section 6.5. If the Preferred Concept Plan were constructed overnight, high delay and queues would result, as volumes would exceed capacity. Over time, traffic will divert to alternate routes until a stable condition is reached. By the year 2030, traffic volumes along University Avenue are forecast to increase due to the Community Plan density increases along the corridor. As a result of this growth and due to the constrained capacity through this 1.9-mile section of University Avenue, an increase in traffic volume will be diverted to parallel routes.

On-Street Parking

Parallel on-street parking was proposed to remain unchanged through much of the core section of University Avenue in the Preferred Concept Plan. This core section extends from Idaho Street to Iowa Street, with on-street parking on the north and south sides of University Avenue. Angled or diagonal parking spaces that are currently provided along University Avenue were also proposed to remain unchanged. All parallel parking would be lost to the west of Idaho Street due to the transit only lanes and raised median.

Between Idaho Street and Iowa Street, transit vehicles would merge with through traffic into a single lane to navigate around the parallel on-street parking. This would result in an increase in merge and weave maneuvers through the core of the corridor due to the transitioning of transit vehicles into the mixed flow or traffic lane. The maneuvering of the transit vehicles into the mixed flow lane will impose additional delays and stop time to vehicles traveling in the mixed flow inside lanes of University Avenue.

The forecast traffic volumes along the corridor during the peak hours under the Preferred Concept Plan would result in an underutilization of parking along University Avenue. Although parking spaces may be provided, the slow, steady flow of peak hour traffic in one lane would create an unfriendly environment

for vehicles to attempt to park. Drivers may be intimidated to back into or stop on-coming traffic to access a parking space.

If a driver chooses to use the parallel parking spaces along University Avenue, that vehicle would need to back up into oncoming traffic to parallel park in most parking spaces. Where parallel parking is preserved along University Avenue, lane widths are approximately 8 feet for parking and 10 to 11 feet for mixed flow traffic. The plan also includes a raised median. With the raised median, there would be no buffer for the mixed flow traffic. Therefore, queues will form behind any vehicle attempting to pull into a parallel parking space, and will continue to lengthen until the vehicle is out of the travel way.

Roundabout at Texas Street

As proposed in the Preferred Concept Plan, the roundabout at Texas Street would be a single lane roundabout. Approaching the roundabout from the east and from the west, transit vehicles and mixed traffic merge into a single lane to traverse the roundabout. Speeds through the roundabout are designed to be approximately 18 mph. Forecast traffic volumes for the intersection of Texas Street and University Avenue exceed the capacity of a single lane roundabout. Due to the inadequate capacity of the single lane roundabout, queues would develop that block upstream and downstream intersections, and block access from the side streets.

Raised Median

The Preferred Concept Plan includes a raised median planned for the length of the corridor. Median breaks were proposed only at the signalized intersections.

By introducing a raised median, left turn access to and from unsignalized side streets would be prohibited. Vehicles exiting these unsignalized side streets would be forced to make a right turn. U-turns would not be permitted along University Avenue. Therefore, vehicles that currently go through at or turn left off the side streets onto University Avenue would be required to find an alternate route. Similarly, vehicles wishing to turn left from University Avenue onto an unsignalized side street would be required to turn left at the previous signalized intersection or bypass their destination and turn left at the next signalized intersection. This would result in some re-routing of traffic along Lincoln Avenue, North Park Way, and Wightman Street, as well as on the side streets intersecting University Avenue at signalized intersections.

Spacing of Signalized Intersections

To maintain a smooth flow of traffic, the signalized intersections along the corridor will need to be coordinated. This is the process of setting the signal timing such that vehicles traveling along University Avenue receive the green indication at as many signalized intersections as possible. This will be necessary to help the forecast traffic volumes traverse the corridor and minimize delays, stops and driver frustration. The more closely spaced intersections are, the more critical coordination becomes. If the

signals for closely spaced intersections are not coordinated, queues will form that may affect the operations of the upstream intersections and the corridor as a whole.

6.2 ELEMENTS OF THE CONCEPT PLAN AFFECTING TRANSIT

Queue Jumper Lanes

The Preferred Concept Plan provides six queue jumper lanes. The purpose of the queue jumper lane is to help reduce traffic signal delay for transit vehicles in the corridor and improve overall transit travel time. Queue jumpers allow buses to bypass queuing cars waiting at traffic signals, allowing them to reach the transit stops faster, bypass intersection congestion, and help ensure transit vehicles don't miss the signal cycle.

Queue jumpers are only effective at signalized intersection where heavy queues are created or anticipated. Three (3) of the Preferred Concept Plan queue jumper lanes would be serving the westbound lanes. These lanes are located at:

- Illinois Street
- 30th Street
- Park Boulevard

The Preferred Concept Plan queue jumper lanes serving the eastbound lanes would be located at:

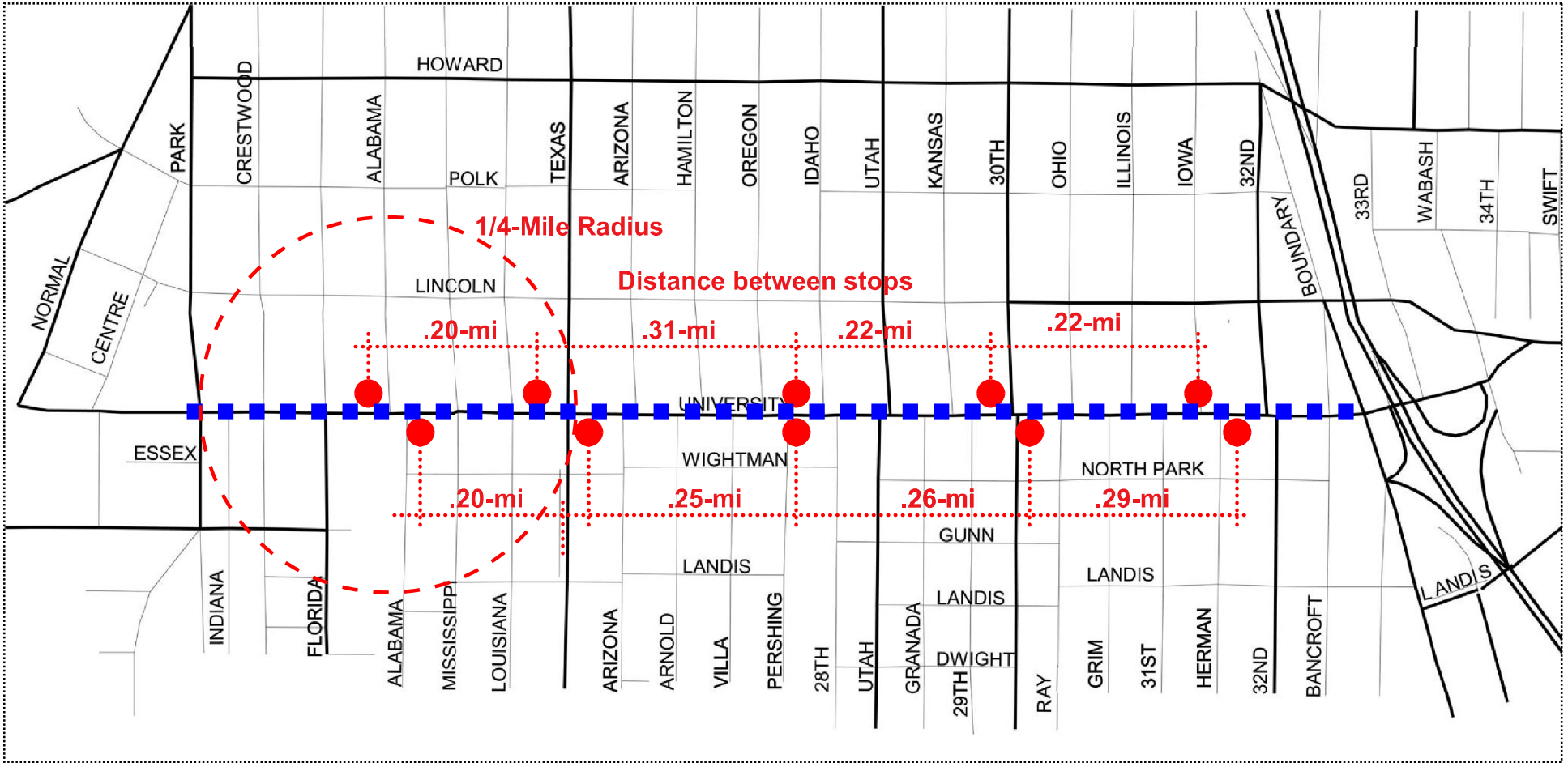
- Park Boulevard
- Florida Street
- 30th Street

In order for queue jumper lanes to provide significant benefit, intersection queues need to regularly extend more than four (4) cars per lane. When a queue jump lane is shared with a right turning vehicles and there are high volumes of right-turning vehicles (particularly at intersections with high pedestrian crossing activity), the effectiveness of these queue jumpers is reduced.

Reduction of Transit Stops

As stated earlier there are 20 existing transit stops serving the corridor from Interstate 805 to Park Boulevard. The existing stops are evenly divided with 10 stops serving the westbound routes and 10 serving the eastbound routes. Both Routes 7 and 908 utilize the same transit stops.

The Preferred Concept Plan would reduce the number of transit stops from 20 to 10 as illustrated in Exhibit 6-2. Again, the stops are evenly divided with five (5) serving the westbound routes and five (5)



● Route 7 and 908 Proposed Transit Stops

.20-mi Distance Between Stops

Not to Scale

LOCATION OF PROPOSED TRANSIT STOPS WITHIN STUDY AREA

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EXHIBIT 6-2

serving the eastbound routes. This reduction is intended to consolidate the passengers boarding and alighting areas, allow for fewer stops, and provide faster transit service within the corridor.

Consolidation of stops would lead to a decrease in travel time within the corridor. SANDAG/MTS has found that transit stop consolidation can have a time savings of typically 15-seconds for each eliminated stop.

With the reduction of transit stops, the redistribution of passengers to the new transit stop locations would occur. As part of this analysis, a table was prepared showing the potential redistribution of the passengers based on the transit stop reductions. The redistribution is used to calculate dwell times and help define the overall transit travel time with the study area. Table 6-1 shows these redistributions of passengers. Table 6-2 summarizes the forecast dwell times for the 2030 with Preferred Concept Plan scenario based on the VISSIM model runs for the Preferred Concept Plan conditions.

Table 6-1
2030 With Preferred Concept Plan
Ridership Forecast – Route 7 & Route 908

Westbound Station Locations	Route 7	Route 908	Total	RANK
Iowa St.	395	140	535	**4**
30th St.	1019	473	1492	**1**
Idaho St.	251	109	360	**6**
Texas St.	640	136	776	**3**
Alabama St.	248	138	386	**5**
Park Blvd.	877	243	1120	**2**
Eastbound Station Locations	**Route 7**	**Route 908**	**Total**	**RANK**
Park Blvd.	686	210	896	**2**
Alabama St.	314	148	462	**4**
Texas St.	279	108	387	**6**
Pershing St.	341	108	449	**5**
30th St.	997	422	1419	**1**
32nd St.	394	149	543	**3**

Table 6-2
2030 with Preferred Concept Plan
Dwell Time Summary

Eastbound Route 908 Stop Locations	AM			PM		
	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)
Alabama Street	2	17%	10.0	9	3%	11.4
Texas Street	6	0%	10.7	3.5	12%	12.9
Pershing Avenue	6	7%	11.8	6.5	7%	10.9
30th Street	14	27%	14.5	23.5	46%	22.3
Grim Avenue	2	12%	9.6	8.5	17%	12.9

Westbound Route 908 Stop Locations	AM			PM		
	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)
Iowa Street	6	1%	9.1	18	5%	15.1
30th Street	35	13%	26.5	18.5	52%	18.8
Oregon Street	9	0%	0.0	7.5	0%	0.0
Louisiana Street	5	0%	0.0	13	0%	0.0
Alabama Street	4	18%	16.7	14	17%	20.0

Eastbound Route 7 Stop Locations	AM			PM		
	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)
Alabama Street	11	2%	11.6	19	4%	11.0
Texas Street	8	7%	10.7	17	9%	12.9
Pershing Avenue	9	5%	11.2	17	5%	10.3
30th Street	21	18%	16.8	81	26%	25.9
Grim Avenue	10	6%	14.4	29	8%	20.0

Westbound Route 7 Stop Locations	AM			PM		
	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)	Boarding (Pass./Hr)	Alighting Trip %	Average Dwell (Sec/Stop)
Iowa Street	16	4%	13.6	19	7%	13.2
30th Street	25	22%	19.1	43	29%	23.1
Oregon Street	13	6%	15.6	7	6%	11.6
Louisiana Street	25	2%	18.4	16	8%	14.0
Alabama Street	10	1%	12.1	5	6%	10.2

Farside Transit Stops

All of the proposed transit stops have been established as far side locations. The purpose for placing the stops on the far side of intersections, as shown in the Preferred Concept Plan, is to provide for improved transit times. Far-side transit stop are a preferred location by most transit agencies including SANDAG and MTS. Far-side stops have the added benefit of:

- Minimizing conflicts with right turning vehicles.
- Minimizing sight distance safety conflicts for both pedestrians and motorists.
- Encouraging pedestrians to cross behind the bus rather that in front of it.
- Better facilitating bus reentry into mixed-flow traffic.
- Allowing the transit vehicle to pass the intersection before loading/unloading passengers thereby eliminating the potential need to wait through another signal cycle.

Impacts of Pedestrian Crossings on Transit Operations

In the Preferred Concept Plan the pedestrian crossings have been restricted to either signalized intersections or selected unsignalized marked crossings. The proposed unsignalized crossings are co-located with nearby transit stops at:

- Iowa Street
- Idaho Street
- Alabama Street

A high volume of pedestrians crossing at either the signalized intersections or unsignalized crossings may affect the transit vehicles travel times (particularly at peak travel periods). The pedestrian crossing could reduce the available cycle time for the transit signal priority thereby affecting the overall transit travel time through the corridor.

Transit Signal Priority

Transit signal priority provides preferential treatment for transit vehicles at traffic signals. This can be accomplished in several ways. The simplest strategy is to set basic timings for intersection approaches to favor approaches used by transit vehicles. Another strategy is to provide initial "signal preference" for transit vehicles stopped at the intersection. This method works in conjunction with queue jumping and dedicated transit lanes, whereby transit vehicles receive a short exclusive transit phase to get a head-start on the other traffic.

Roundabout at Texas Street

The Preferred Concept Plan includes a single lane roundabout at the intersection at Texas Street. The roundabout is intended to reduce turning conflicts, slow down through traffic, and maintain a steady flow of traffic through the intersection.

The roundabout would have an impact on transit vehicles by possibly changing the travel speed from that through a typical signalized intersection. The operational analysis helped determine whether the roundabout would help or hinder transit mobility within the corridor.

Transit Only Lane

Transit only lanes (both eastbound and westbound) are proposed to address and minimize the conflicts with general traffic. Obviously, the transit only lanes would have the greatest effect on transit mobility and travel time within the corridor. For westbound transit vehicles the transit only lanes extend from:

- Boundary Street to Illinois Street, and from
- Idaho Street to Florida Street

For eastbound transit vehicles the transit only lanes extend from:

- Florida Street to 30th Street, and from
- Herman Street to Boundary Street

Under the Preferred Concept Plan design, the main issue for the transit only lanes is potential problems where the transit vehicles would be required to merge from the transit only lanes into the mixed-flow lanes. These merge points occur at the transition into the mixed-flow lane due to on-street parking in the commercial core area, when entering the roundabout at Texas Street, and when leaving the project study area where the transit only lanes end.

Curb Extensions (Bulb-outs)

Curb extensions or pedestrian bulb-outs are extensions of the sidewalk into the street providing a wider waiting area for pedestrians or transit passengers at intersections and unsignalized crosswalks. Most curb extensions (bulb-outs) extend the sidewalk toward the traffic lane, reducing the curb-to-curb distance and pedestrian exposure time to moving vehicles.

The Preferred Concept Plan includes multiple locations for these curb extensions (bulb-outs) to occur. Typically the bulb-outs are associated with major intersections, unsignalized pedestrian crossings, transit stops and protective areas for on-street parking.

Curb extensions (bulb-outs) at bus stops can reduce delay for buses and provide an enhanced passenger-waiting environment. Bulb-outs at transit stops reduce travel times by eliminating the time normally lost after stopping to board passengers when buses wait for an acceptable gap to re-enter traffic because the bus stops in the parking or dedicated transit only lane.

On-Street Angled Parking

The Preferred Concept Plan maintained on-street angled parking on the south side of University Avenue from 28th Street to 30th Street. Although not as disruptive as parallel parking maneuvers, angled on-street parking can have an impact on traffic flow. Parked cars backing up into oncoming traffic can cause momentary delays. This is especially true during peak traffic periods.

In the Preferred Concept Plan the angled parking is adjacent to the eastbound transit only lane from 28th Street to 30th Street. Cars leaving the parking spaces would back into the transit only lane. This movement could create problems for transit vehicles and interrupt the bus progression through the corridor. However, given the headway times of 6-minutes (peak period) and 10-minutes (non-peak period) conflicts between the parked cars and transit vehicles should be minimal.

6.3 ELEMENTS OF THE PREFERRED CONCEPT PLAN AFFECTING PEDESTRIANS

Pedestrians stand to gain the most benefit from the Preferred Concept Plan. In addition to slower moving traffic, more frequent and improved warnings and markings will be provided for pedestrians to cross from one side of University Avenue to the other. Table 6-3 summarizes the distances between crossings along University Avenue with the Preferred Concept Plan.

New Enhanced Pedestrian Crossings

In the Preferred Concept Plan enhanced pedestrian crossings are proposed on University Avenue at four locations:

- Herman Avenue
- Kansas Street
- Idaho Street
- Alabama Street

In addition, enhanced pedestrian crossings are proposed on three side streets at University Avenue:

- 28th Street
- Idaho Street
- Alabama Street

At the locations crossing University Avenue, in pavement flashers would notify oncoming traffic of the presence of a pedestrian along side or within the crosswalk. At the enhanced pedestrian crossings across the side streets, bulb-outs and improved pavement markings are planned. Although the in-pavement flasher technology is currently available, the City of San Diego is in the process of selecting a preferred technology to be implemented Citywide. Typical operations require that a pedestrian press a button to activate the in pavement flashing devices. This will require a 4-foot post, pedestrian push button, and power source.

Table 6-3
Preferred Concept Plan Distance Between
Marked Crosswalks Across University Avenue (North-South)

From	To	Future Distance	Topography
Park Boulevard	Florida Street	705’	Steep Grade Under Georgia Bridge
Florida Street	Mississippi Street	685’	Steep Grade
Mississippi Street	Texas Street	510’	Steep Grade
Texas Street	Arnold Street	535’	Steep Grade
Arnold Street	Oregon Street	425’	Steep Grade
Oregon Street	Idaho Street	360’	Partial Grade
Idaho Street	Utah Street	250’	Level
Utah Street	Kansas Street	360’	Level
Kansas Street	30th Street	310’	Level
30th Street	Ohio Street	300’	Level
Ohio Street	Illinois Street	300’	Level
Illinois Street	Iowa Street	390’	Level
Iowa Street	32nd Street	280’	Level
32nd Street	Boundary Street	575’	Level

New Traffic Signals

In addition to the enhanced pedestrian crossings, two new traffic signals are proposed on University Avenue with the Preferred Concept Plan:

- Arnold Avenue
- Oregon Street

With the installation of the new traffic signals at these two locations, new crosswalks would be striped on all legs of the intersections. The existing overhead flashing lights and signs at Arnold Avenue and Pershing Avenue would be removed with the installation of these traffic signals.

Removal of Crosswalks

The Preferred Concept Plan would remove existing marked crosswalks at:

- Arnold Avenue (existing unsignalized crossing)
- Pershing Avenue (existing unsignalized crossing)
- Grim Street (existing signalized intersection)

The removal of the unsignalized crossing at Arnold Avenue would occur in conjunction with the installation of the traffic signal at that location. The overhead flashing light and sign associated with the existing unsignalized Arnold Avenue crossing would be removed when the traffic signal is installed. New crosswalks would be striped on all legs of the intersection with the new traffic signal.

Pershing Avenue is located between Oregon Street and the proposed enhanced pedestrian crossing at Idaho Street. The Pershing Avenue marked crosswalk, flashing beacon and sign would be removed with the installation of the traffic signal at Oregon Street.

The Preferred Concept Plan proposes to remove the crosswalk at Grim Street, an existing signalized intersection. Through this section of University Avenue, there are multiple signalized crossing opportunities for pedestrians. By removing the pedestrian crossings on University Avenue (not the traffic signal) at Grim Street, the distance between marked crossings can be maintained at 300 feet or less through the central business district and pedestrians would be encouraged to cross at a safer location.

Curb Extensions (Bulb-outs)

Curb extensions reduce the exposure time for pedestrians as they cross the street by reducing the distance from curb to curb. Bulb-outs can only be provided if on-street parking is provided, otherwise, the bulb-out would extend into a travel lane disrupting the flow of traffic. The Preferred Concept Plan includes bulb-outs on the side streets at the following locations:

- Alabama Street
- Louisiana Street
- Arizona Street
- Oregon Street
- Idaho Street
- Utah Street
- Granada Street
- Kansas Street
- 29th Street
- 30th Street
- Illinois Street
- Iowa Street

Table 6-4 provides a comparison of crossing distances at all locations where bulb-outs are proposed in the Preferred Concept Plan.

Table 6-4
Crossing Distances at Intersections with Proposed Bulb-outs
Preferred Concept Plan

Location	Scenario	Crossing Distance (Curb to Curb)			
		North Leg	South Leg	East Leg	West Leg
University Avenue/Alabama Street	Existing	52’	40’	--	--
	Preferred Concept Plan	30’			
University Avenue/Louisiana Street	Existing	52’	40’	--	--
	Preferred Concept Plan	25’			
University Avenue/Arizona Street	Existing	52’	40’	--	--
	Preferred Concept Plan	30’			
University Avenue/Oregon Street	Existing	42’	--	--	--
	Preferred Concept Plan	24’			
University Avenue/Idaho Street	Existing	52’	--	--	--
	Preferred Concept Plan	24’			
University Avenue/Utah Street	Existing	52’	52’	52’	70’
	Preferred Concept Plan	40’	44’	--	60’
University Avenue/Granada Street	Existing	--	52’	--	--
	Preferred Concept Plan	--	34’	--	--
University Avenue/Kansas Street	Existing	52’	--	--	--
	Preferred Concept Plan	24’			
University Avenue/29th Street	Existing	--	52’	--	--
	Preferred Concept Plan		24’		
University Avenue/30th Street	Existing	52’	52’	62’	76’
	Preferred Concept Plan	35’			
University Avenue/Illinois Street	Existing	52’	--	52’	52’
	Preferred Concept Plan	30’			
University Avenue/Iowa Street	Existing	52’	--	--	--
	Preferred Concept Plan	25’			

Note: Crossing distances affected by intersection pop-outs and the design of side-street parking in accordance with the City of San Diego Street Design Manual. Streets with parallel parking on both sides typically have a wider curb to curb distance at intersection pop-outs than streets with angled parking on both sides. Angled parking protrudes further into the travel way, which often doubles as a traffic calming measure.

Relocation of Transit Stops

Currently, transit stops are located approximately 0.12 miles apart (approximately 500 feet) on either side of University Avenue. A total of 20 transit stops, 10 eastbound and 10 westbound serve Route 7 and Route 908. The Preferred Concept Plan would result in the consolidation of these 20 transit stops to 10 stops, 5 eastbound and 5 westbound.

The consolidation of transit stops would result in an increase in walking distance for pedestrians along the corridor. Table 6-5 provides a comparison of walking distances between transit stops.

Table 6-5
Distance Between Transit Stops
Preferred Concept Plan

Eastbound		Westbound	
Stop Locations	**Distance to Between Stops**	**Stop Location**	**Distance Between Stops**
Park Blvd. to Alabama St.	1,000’	Iowa to 30th St.	1,230’
Alabama St. to Texas St.	1,000’	30th St to Idaho St.	1,360’
Texas St. to Idaho St.	1,520’	Idaho St. to Texas St.	1,100’
Idaho St. to 30th St.	1,070’	Texas St to Alabama St.	1,090’
30th St. to Iowa St.	1,290	Alabama St. to Park Blvd.	1,360’

6.4 ELEMENTS OF THE PREFERRED CONCEPT PLAN AFFECTING BICYCLES

Transit Only Lane

Bicycles currently share the travel way with passenger vehicles, trucks and buses. Under the Preferred Concept Plan, bicycles would be allowed to travel in the transit only lane. Transit vehicles travel at approximately 6 to 10 minute headways along University Avenue. With 11 feet of travel way, bicycles would be provided more capacity with the transit only lane as proposed in the Preferred Concept Plan than in existing or 2030 No Build conditions.

However, if the Historic Streetcar moves forward and is implemented (refer to Chapter 10), tracks would be installed in this transit only lane. Tracks in the transit only lane would preclude bicycles from sharing this lane due to safety issues associated with bike tires and light rail track.

Through the most populated portions of the corridor with the highest traffic volume (Idaho Street to Iowa Street), the transit lane would end and on-street, parallel parking would be permitted. The mixed flow

lane through this section is approximately 10 to 11 feet wide through this section and is sandwiched between the raised median and the parking lane. The potential for car doors opening into traffic and the elimination of buffer area created by the raised median would, create an unsafe environment through the core of the University Avenue corridor for bicycles. Bicycle activity along University Avenue through the core would be anticipated to decrease due to the constrained conditions with the Preferred Concept Plan.

New Traffic Signals & Enhanced Pedestrian Crossings

Many of the benefits identified for pedestrians also apply to recreational bicyclists. Although most bicyclists use parallel routes to University Avenue such as North Park Way and Lincoln Avenue, the enhanced crossings across University Avenue and the new traffic signals at Oregon Street and Arnold Street will improve access north and south of the corridor.

6.5 SANDAG Traffic Modeling Efforts

Chapter 5 discussed the details of the traffic modeling efforts for this project. As discussed in Chapter 5, the SANDAG Series 10 traffic model for the City of San Diego was used to forecast the future 2030 traffic volumes along the corridor. Capacity constraints were imposed along the corridor to reflect the Preferred Concept Plan including signals at Oregon Street and Arnold Avenue and the reduction in travel lanes from four to two. With and without Preferred Concept Plan conditions were modeled. In addition to the 2030 forecast traffic volumes for each scenario, several select link reports were produced for each scenario. The select link analysis was vital to the process of evaluating the redistribution of traffic due to the constrained capacity.

Through the modeling efforts, it was determined that a small portion (5 to 10 percent) of the traffic traveling through the corridor travels from one end to the other. Existing conditions data collected for the corridor confirms this model run data. Therefore, most trips entering and exiting University Avenue between Park Boulevard and I-805, from the east or from the west are destined for or are coming from locations within the study area.

The Preferred Concept Plan would reduce the capacity of University Avenue from two lanes in each direction to one lane in each direction plus a transit only lane in each direction for most of its length. The exception is the core of the corridor, between Idaho and Iowa Streets, where capacity is further constrained by eliminating the transit only lanes to accommodate the on-street parallel parking.

The traffic modeling efforts show that approximately ten percent of the traffic along University Avenue would find an alternate route north of the corridor (most probably Lincoln Avenue). Approximately five to ten percent of the traffic would divert to the south of University Avenue, most probably to North Park

Way. Approximately five percent of the traffic would avoid the corridor all together by taking routes such as El Cajon Boulevard and/or Upas Street to avoid University Avenue.

It is anticipated that the diversion of traffic would primarily occur during the peak hours, and when hourly traffic volume along the corridor exceeds the reasonable hourly per lane capacity of the corridor. To assess the amount of peak hour traffic that would be diverted, the peak hour capacity of the roadway was calculated.

In order to calculate the peak hour lane capacity on University Avenue, the peak hour lane capacities and saturation flow rates for the future two-lane roadway with the Preferred Concept Plan scenarios were examined. The HCM analysis conducted for the following signalized intersections internal to the study corridor was compared to determine the average per lane capacity:

- Florida Street
- Texas Street
- Utah Street
- 30th Street
- 32nd Street

The ideal saturation flow rate for a typical travel lane is 1,900 vehicles per hour per lane (vphpl). The "ideal saturation flow rate" is typically achieved when all forms of friction (parked vehicles, narrow lanes, etc) and the effects of traffic signals are minimized. On a corridor such as University Avenue, traffic signals are the main source of capacity reduction, particularly when they are closely spaced. To estimate the prevailing saturation flow rates in each direction along University Avenue where traffic signals control the flow of traffic in the peak hours, the respective "green to cycle" ratios (g/c ratios) were calculated. Then the g/c[1] ratio was multiplied by the ideal saturation flow rate (1,900 vphpl) to obtain the "prevailing saturation flow rate". The average of the saturation flow rates for the examined intersections was roughly 950 vehicles per hour. The calculation worksheet to establish this average saturation flow rate is provided in the Appendix at the end of this report.

In addition, the lane group capacities calculated by the HCM analysis were examined for the sample five intersections along the corridor. In this case, the University Avenue through movement lane group capacity[2] was compared. The average of the lane group capacities (when divided by two to account for a single through lane) was roughly 820 vehicles per hour.

[1] The g/c ratio is the amount of effective green time (green indication plus change interval minus vehicle start-up lost time) over the cycle length.

[2] The lane group capacity refers to the maximum number of vehicles that can be accommodated per lane group.

Based on the HCM and g/c ratio calculations, it was determined that a peak hour lane capacity of 850 vehicles per hour was appropriate for the corridor. As traffic volumes approach or exceed this value, diversion to alternate routes is expected to occur.

6.6 Measures of Effectiveness

Measures of Effectiveness, MOE's, are the criteria by which the operations of the corridor are evaluated and compared. MOE's were defined for each transportation mode for the corridor:

- Traffic: Intersection Delay, Travel Time, Stops
- Transit: Intersection Delay, Travel Time, On-Time Performance, Accessibility

The following two sections provide an overview of the MOE's calculated for the short-term (2010) and horizon year (2030) with Preferred Concept Plan scenarios.

6.7 Near–Term (Year 2010) With Preferred Concept Plan

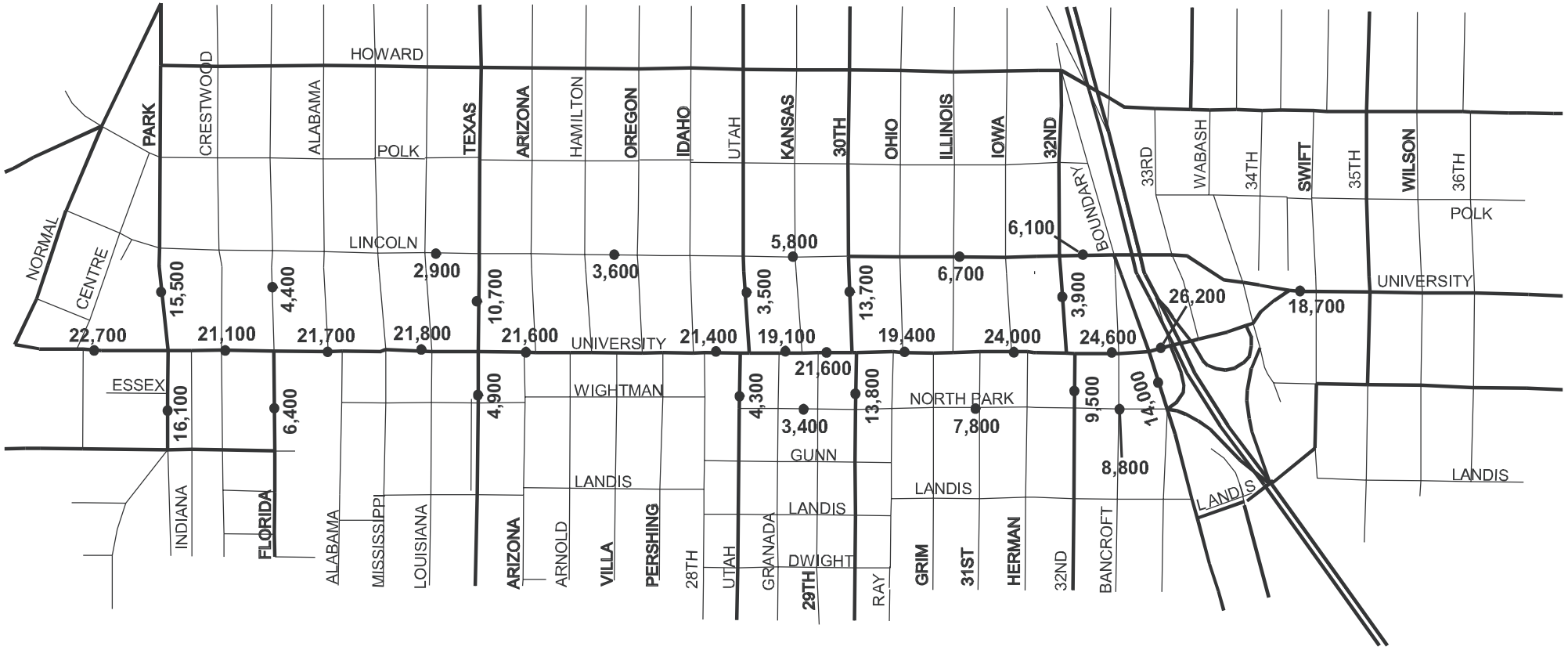
The Near-Term (Year 2010) analysis determined the operating conditions along the corridor in Year 2010 if Preferred Concept Plan were fully implemented. Based on the Implementation Plan, presented in Chapter 9 of this document, if funding were available it would be reasonable to assume that the University Avenue Mobility Plan would be implemented within 5 to 6 years. Therefore, the year 2010 was assumed as the project completion date.

Traffic

The 2030 traffic forecast volumes were compared to existing traffic volumes to derive an overall corridor growth rate factor for the corridor. In general, traffic volumes were assumed to grow at a constant rate over the 6-year period between 2004, when traffic data was collected, and 2010.

Evaluation of existing conditions shows that in the eastbound direction, existing peak hour volumes exceed the available peak hour lane capacity on a two-lane University Avenue. As traffic volume increases by year 2010, the corridor would continue to be constrained by the capacity of a single lane in each direction. Therefore, eastbound traffic along University Avenue in the p.m. peak hour remains relatively constant between 2004, 2010 and 2030. Diverted traffic volumes increase as density increases along University Avenue, in the Greater North Park community and the region as a whole.

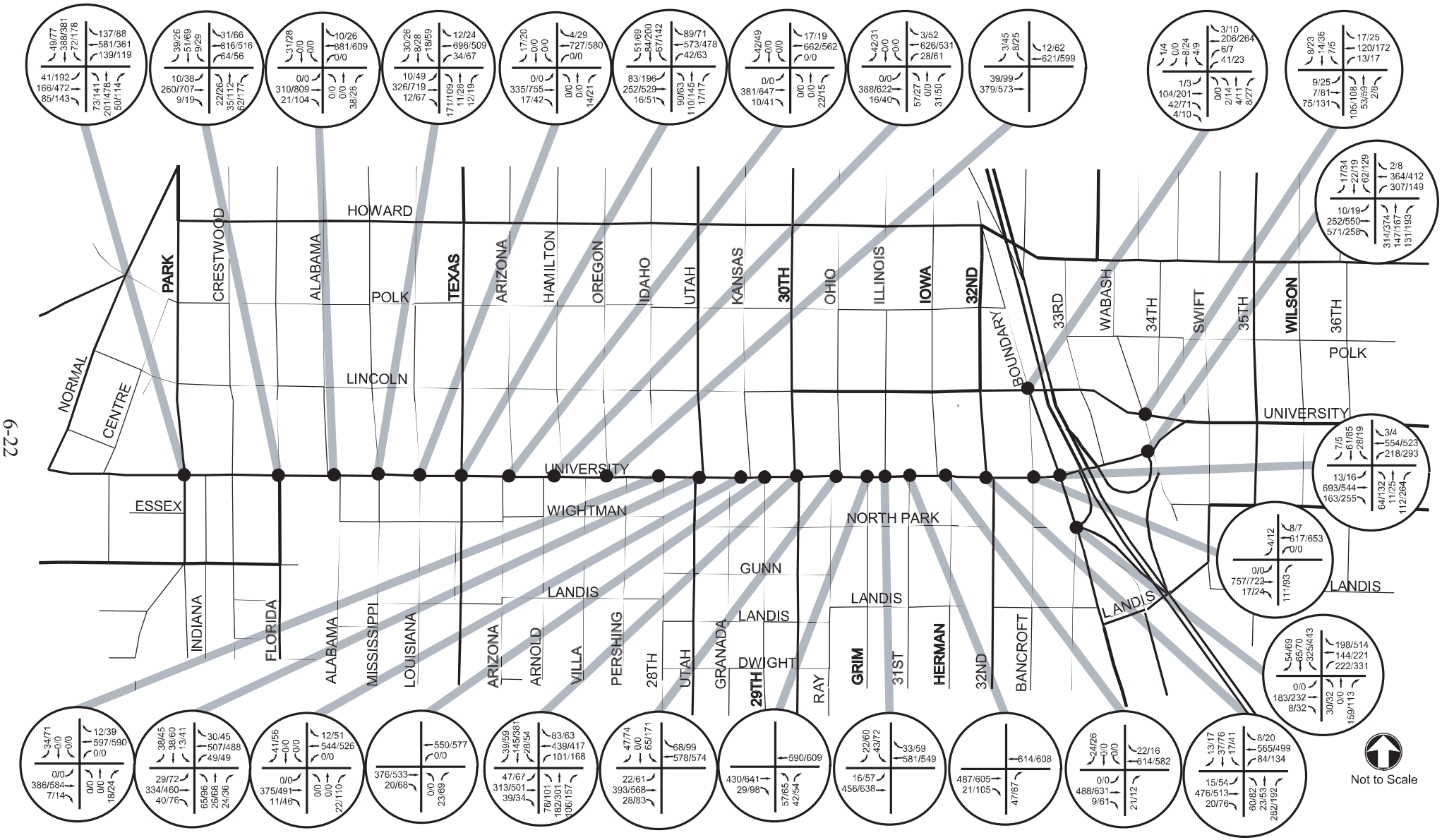
Exhibit 6-3 illustrates the 2010 with Preferred Concept Plan scenario average daily traffic (ADT) volumes for the study corridor. Peak hour intersection volumes are illustrated in Exhibit 6-4.



2010 WITH PREFERRED CONCEPT PLAN ADT

55-100140.001 - March 2004 (2004-0331)

EXHIBIT 6-3



YEAR 2010 WITH PREFFERED CONCEPT PLAN PEAK HOUR VOLUME

EXHIBIT 6-4

Roadway Segment Analysis

The 2010 with Preferred Concept Plan scenario roadway segment level of service analysis for the study area is summarized in Table 6-6. As shown in the table, University Avenue would be expected to operate at LOS F from Park Boulevard to Wabash Avenue by the year 2010 due to the constrained capacity along University Avenue.

With the addition of diverted traffic to the segments of North Park Way, from 30th Street to Boundary Street; 32nd Street, from University Avenue to North Park Way; and Boundary Street, from University Avenue to North Park Way, the roadways would continue to operate at LOS E and F conditions as forecast under 2010 no build conditions.

HCM Intersection Level of Service

Tables 6-7 and 6-8 present the 2010 With Preferred Concept Plan scenario level of service at the signalized and unsignalized study intersections, respectively, based on the HCM methodology.

As shown in Table 6-7, the intersection of University Avenue/Park Boulevard would to operate at LOS F with the Preferred Concept Plan by year 2010. The single-lane roundabout at Texas Street would operate at LOS C in the p.m. peak hour. The analysis of the Preferred Concept Plan includes three new traffic signals: Arnold Avenue, Oregon Street and I-805/Boundary. All future signals would operate at LOS C or better.

Because of the prohibited left turn movement for the unsignalized side streets, the overall level of service for the side streets would generally improve based on the HCM level of service methodology, when compared to no build conditions. As shown in Table 6-8, all side streets would operate at LOS C or better based on the HCM methodology. However, the HCM analysis is not capable of evaluating the interaction between intersections, since HCM is an isolated intersection analysis methodology. Due to the high volume of traffic and the constrained capacity along the corridor, it is anticipated that queues will form along University Avenue that may affect the ability of vehicles on side streets to access University Avenue. Such constraints were observed to occur using the VISSIM software analysis.

Table 6-6
Horizon Year 2010 With Preferred Concept Plan
Roadway Segment Level of Service Analysis

Street	Limit	2010 with Preferred Concept Plan					2010 No Build*			Change in…	
		Class (Lanes)	Capacity	ADT	LOS	V/C	ADT	LOS	V/C	ADT	V/C
University Avenue	Centre to Park	C + LTL (4)	30,000	22,700	D	0.76	22,700	D	0.76	0	0.00
	Park to Florida	C + RM (2)	15,000	**21,100**	**F**	**1.41**	21,100	D	0.70	0	0.71
	Florida to Texas	C + RM (2)	15,000	**21,800**	**F**	**1.45**	**21,800**	**F**	**1.45**	0	0.00
	Texas to Utah	C + RM (2)	15,000	**21,600**	**F**	**1.44**	**22,000**	**F**	**1.47**	-400	-0.03
	Utah to 30th	C + RM (2)	15,000	**21,600**	**F**	**1.44**	**22,000**	**F**	**1.47**	-400	-0.03
	30th to 32nd	C + RM (2)	15,000	**24,000**	**F**	**1.60**	**24,300**	**F**	**2.03**	-300	-0.43
	32nd to Boundary	C + RM (2)	15,000	**24,600**	**F**	**1.64**	24,600	D	0.82	0	0.82
	Boundary to Wabash	Collector (4)	15,000	**26,200**	**F**	**1.75**	**26,200**	**F**	**1.75**	0	0.00
Lincoln Avenue	Louisiana to Texas	Collector (2)	8,000	2,900	B	0.36	2,900	B	0.36	0	0.00
	Texas to Utah	Collector (2)	8,000	3,600	C	0.45	3,000	B	0.38	600	0.07
	Utah to 30th	C + TWLTL (2)	15,000	5,800	B	0.39	5,300	B	0.35	500	0.04
	30th to Boundary	C + TWLTL (2)	15,000	6,700	B	0.45	5,900	B	0.39	800	0.06
	Boundary to Wabash	C + TWLTL (2)	15,000	6,100	B	0.41	5,300	B	0.35	800	0.06
North Park Way	Utah to 30th	Collector (2)	8,000	3,400	B	0.43	2,500	A	0.31	900	0.12
	30th to 32nd	Collector (2)	8,000	**7,800**	**E**	**0.98**	**6,900**	**E**	**0.86**	900	0.12
	32nd to Boundary	Collector (2)	8,000	**8,800**	**F**	**1.10**	**8,500**	**F**	**1.06**	300	0.04

Table 6-6 (continued)
Horizon Year 2010 With Preferred Concept Plan
Roadway Segment Level of Service Analysis

Street	Limit	2010 with Preferred Concept Plan					2010 No Build*			Change in…	
		Class (Lanes)	Capacity	ADT	LOS	V/C	ADT	LOS	V/C	ADT	V/C
Park Boulevard	Lincoln to University	Major (4)	40,000	15,500		0.39	15,500	B	0.39	0	0.00
	University to Essex	Major (4)	40,000	16,100	B	0.40	16,100	B	0.40	0	0.00
Texas Street	Lincoln to University	C + TWLTL (2)	15,000	10,700	D	0.71	9,400	C	0.63	1,300	0.08
	University to Wightman	Collector (2)	8,000	4,900	C	0.61	4,400	C	0.55	500	0.06
Utah Street	Lincoln to University	Collector (2)	8,000	3,500	B	0.44	3,400	B	0.43	100	0.01
	University to North Park	Collector (2)	8,000	4,300	C	0.54	3,800	C	0.48	500	0.06
30th Street	Lincoln to University	C + TWLTL (2)	15,000	**13,700**	**E**	**0.91**	**13,700**	**E**	**0.91**	0	0.00
	University to North Park	C + TWLTL (2)	15,000	**13,800**	**E**	**0.92**	**13,800**	**E**	**0.92**	0	0.00
32nd Street	Lincoln to University	Collector (2)	8,000	3,900	C	0.49	3,900	C	0.49	0	0.00
	University to North Park	Collector (2)	8,000	**9,500**	**F**	**1.19**	**9,100**	**F**	**1.14**	400	0.05
Boundary Street	Lincoln to University	Collector (2)	8,000	1,800	A	0.23	1,800	A	0.23	0	0.00
	University to North Park	Collector (2)	8,000	**14,000**	**F**	**1.75**	**13,700**	**F**	**1.71**	300	0.04

Note: Deficient roadway segment operation shown in bold.
C+TWLTL = Collector with Two-Way Left Turn Lane
C+LTL = Collector with Left Turn Lanes
C+RM = Collector with Raised Median
* 2010 No Build Street Classifications and Capacities are shown in Chapter 5, Table 5-1

Table 6-7
2010 With Preferred Concept Plan
Signalized Study Intersection LOS

Study Intersection	2010 No Build		2010 with Preferred Concept Plan		Change in Delay	
	AM Delay – LOS	PM Delay – LOS	AM Delay - LOS	PM Delay – LOS	AM	PM
University Avenue/Park Boulevard	27.3 – C	**156.2 – F**	27.3 – C	**100.5 – F**	0.0	-55.7
University Avenue/Florida Street	8.5 – A	18.5 – B	11.0 – B	25.4 – C	2.5	6.9
University Avenue/Mississippi Street	8.9 – A	8.2 – A	18.6 – B	16.3 – B	9.7	8.1
University Avenue/Texas Street[1]	22.7 – C	35.3 – D	10.7 – B	21.3 – C	-12.0	-14.0
University Avenue/Arnold Avenue[2]	15.7 – C	23.9 – C	7.2 – A	19.8 – B	-8.5	-4.1
University Avenue/Oregon Street[2]	16.0 – C	21.9 – C	17.5 – B	7.4 – A	1.5	-14.5
University Avenue/Utah Street	11.7 – B	16.3 – B	13.9 – B	19.7 – B	2.2	3.4
University Avenue/30th Street	17.0 – B	35.7 – D	24.6 – C	41.3 – D	7.6	5.6
University Avenue/Ohio Street	4.4 – A	8.1 – A	6.1 – A	9.9 – A	1.7	1.8
University Avenue/Grim Street	3.7 – A	3.7 – A	4.8 – A	5.2 – A	1.1	1.5
University Avenue/Illinois Street	4.0 – A	5.1 – A	3.3 – A	5.5 – A	-0.7	0.4
University Avenue/32nd Street	14.0 – B	24.1 – C	20.7 – C	24.7 – C	6.7	0.6
University Avenue/Boundary Street	19.9 – B	23.3 – C	43.2 – D	39.7 – D	23.3	16.4
University Avenue/Wabash Street	19.6 – B	39.1 – D	21.0 – C	31.0 – C	1.4	-8.1
Lincoln Avenue/Wabash Street	12.9 – B	12.2 – B	9.6 – A	12.6 – B	-3.3	0.4
Boundary Street/I-805 SB Ramps	16.5 – B	17.1 – B	19.0 – B	16.1 – B	2.5	-1.0

Note: Deficient intersection operation shown in bold.

[1] Roundabout under Preferred Concept Plan.

[2] Unsignalized under No Build.

Table 6-8
2010 With Preferred Concept Plan
Unsignalized Study Intersection LOS

Study Intersection	Minor Approach Delay – LOS (Overall Delay)					
	2010 No Build		2010 with Preferred Concept Plan		Change in Delay	
	AM	PM	AM	PM	AM	PM
University Avenue/Alabama Street (NB)	17.1 – C (1.7)	**107.7 – F** (4.5)	10.6 – B (0.3)	18.2 – C (0.3)	-6.5 (-1.4)	-89.5 (-4.2)
University Avenue/Alabama Street (SB)	14.9 – B (0.5)	16.2 – C (0.4)	18.5 – C (0.5)	14.0 – B (0.2)	3.6 (0.0)	-2.2 (-0.2)
University Avenue/Louisiana Street	18.9 – C (1.2)	**35.5 – E** (1.4)	15.4 – C (0.4)	15.9 – C (0.4)	-3.5 (-0.8)	-19.6 (-1.0)
University Avenue/Arizona Street (NB)	13.9 – B (0.6)	21.5 – C (0.5)	10.9 – B (0.2)	13.7 – B (0.2)	-3.0 (-0.4)	-7.8 (-0.3)
University Avenue/Arizona Street (SB)	13.7 – B (0.7)	18.3 – C (0.8)	16.4 – C (0.6)	14.4 – C (0.5)	2.7 (-0.1)	-3.9 (-0.3)
University Avenue/Arnold Street[1]	17.6 – C (1.3)	33.5 – D (1.8)	-	-	-	-
University Avenue/Hamilton Street	13.1 – B (0.6)	20.5 – C (0.9)	17.7 – C (0.7)	15.3 – C (0.4)	4.6 (0.1)	-5.2 (-0.5)
University Avenue/Oregon Street[1]	17.9 – C (0.4)	26.3 – D (1.1)	-	-	-	-
University Avenue/Idaho Street	12.8 – B (0.6)	21.1 – C (1.4)	13.7 – B (0.4)	14.9 – B (0.8)	0.9 (-0.2)	-6.2 (-0.6)
University Avenue/28th Street	13.3 – B (0.6)	18.7 – C (0.4)	11.3 – B (0.2)	15.2 – C (0.3)	-2.0 (-0.4)	-3.5 (-0.1)
University Avenue/Granada Street	10.8 – B (0.5)	28.5 – D (0.5)	11.0 – B (0.2)	15.7 – C (1.4)	0.2 (-0.3)	-12.8 (0.9)
University Avenue/Kansas Street	13.9 – B (1.0)	27.4 – D (1.5)	13.6 – B (0.6)	14.7 – B (0.7)	-0.3 (-0.4)	-12.7 (-0.8)
University Avenue/29th Street	11.9 – B (0.5)	**35.5 – E** (2.1)	11.2 – B (0.3)	15.5 – C (0.9)	-0.7 (-0.2)	-20.0 (-1.2)
University Avenue/31st Street	10.6 – B (0.4)	15.1 – C (0.7)	13.1 – B (0.5)	20.6 – C (1.3)	2.5 (0.1)	5.5 (0.6)
University Avenue/Iowa Street	21.0 – C (0.8)	28.1 – D (1.1)	15.0 – C (0.3)	14.4 – B (0.3)	-6.0 (-0.5)	-13.7 (-0.8)
University Avenue/Herman Avenue	10.4 – B (0.2)	12.3 – B (0.1)	12.2 – B (0.2)	14.8 – B (0.1)	1.8 (0.0)	2.5 (0.0)
University Avenue/Bancroft Street	13.3 – B (1.2)	14.9 – B (1.2)	19.7 – C (1.5)	17.7 – C (1.2)	6.4 (0.3)	2.8 (0.0)
Boundary Street/Lincoln Avenue	12.6 – B (2.4)	13.7 – B (2.6)	13.1 – B (1.8)	15.8 – C (2.4)	0.5 (-0.6)	2.1 (-0.2)

Note: Deficient intersection operation shown in bold.

[1] Signalized under Preferred Concept Plan conditions.

VISSIM Delay Summary

Table 6-9 summarizes the results of the a.m. and p.m. peak hour delay summary for the corridor as a whole and for the individual intersections along the corridor. Table 6-10 presents the travel time and stops per vehicle data calculated by VISSIM.

The results of the travel time analysis indicates the greatest increase in travel time over Existing conditions would occur in the p.m. peak hour. Westbound, the p.m. peak hour passenger vehicle travel time would be approximately 8.3 minutes from Park Boulevard to Boundary Street. Eastbound passenger vehicle travel time would be approximately 11.2 minutes to travel the corridor.

A review of the VISSIM simulation shows that the single-lane roundabout at Texas Street would cause significant queuing both west and east of the intersection.

An additional constraint observed in the VISSIM simulation affecting both directions of travel is the combined mixed-flow/transit lane portion of University Avenue between Idaho Street and Iowa Street. In this section, passenger and transit vehicles are required to merge at points where the transit-only lane ends and feeds into the mixed-flow lanes and at transit stops.

As stated previously in the HCM analysis section, the HCM methodology does not consider the effect of queuing at nearby adjacent intersections. Review of the simulation indicates that performing a right turn onto University Avenue out of a stop-controlled intersection would become difficult with a steady stream of traffic in the single mixed-flow lane and/or a built up queue on University Avenue.

Table 6-9
2010 With Preferred Concept Plan Conditions
VISSIM Measures of Effectiveness Delay Summary

Study Intersection	2010 with Preferred Concept Plan							
	Total Delay[1]		Concurrent Delay[2]		Conflicting Delay[3]		Person Delay[4]	
	AM	PM	AM	PM	AM	PM	AM	PM
University Avenue/Park Avenue	29.8	76.4	24.4	84.5	37.4	67.7	34.3	77.5
University Avenue/Florida Street	9.6	80.7	4.2	75.7	38.7	95.5	9.3	74.1
University Avenue/Mississippi Street	14.4	38.2	6.6	37.9	50.6	39.8	12.5	33.2
University Avenue/Texas Street	19.0	55.2	22.2	58.7	10.9	47.9	15.2	44.8
University Avenue/Arnold Avenue	8.7	22.6	5.8	22.5	41.2	23.7	6.2	17.0
University Avenue/Oregon Street	3.5	12.3	3.2	11.5	35.4	25.5	3.9	10.4
University Avenue/Utah Street	19.6	42.3	14.1	20.9	44.4	114.1	18.4	37.4
University Avenue/30th Street	25.0	48.1	12.6	19.4	44.2	83.0	26.8	47.6
University Avenue/Ohio Street	7.0	12.4	0.7	4.1	42.0	35.8	6.2	10.7
University Avenue/Grim Street	4.1	4.7	0.5	2.1	39.6	35.5	3.6	3.8
University Avenue/Illinois Street	4.8	6.6	2.4	4.4	24.1	22.8	4.3	5.5
University Avenue/32nd Street	23.3	22.8	14.4	20.4	45.0	29.9	20.5	21.0
University Avenue/Boundary Street	26.0	30.6	23.9	27.7	32.6	35.9	24.6	28.1
University Avenue/Wabash Street	35.5	26.5	32.1	25.8	40.1	27.3	38.1	27.7

1. Intersection Delay = Average vehicle delay for all movements at the intersection (sec/veh)
2. Concurrent Delay = Average vehicle delay imposed to eastbound & westbound through vehicles along University Avenue (sec/veh)
3. Conflicting Delay = Average vehicle delay imposed to northbound & southbound vehicles entering or crossing University Avenue (sec/veh)
4. Seconds per person.

Table 6-10
2010 With Preferred Concept Plan
Travel Time / Stops (I-805 to Park Boulevard)

Direction	Travel Time						Stops[1]					
	Existing		2010 with Preferred Concept Plan		Change		Existing		2010 with Preferred Concept Plan		Change	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Eastbound Park Boulevard to Interstate 805	5.9	7.1	6.7	11.2	0.8	4.1	4	5.9	4.7	11.1	0.7	5.2
Westbound Interstate 805 to Park Boulevard	5.6	7.0	5.7	8.3	0.1	1.3	3.8	5.1	3.2	8.4	-0.6	3.3

Transit

SANDAG has estimated that by year 2010, total transit ridership will increase by two percent (2%) over 2003 figures. This would be an increase of approximately 160 daily passengers within the corridor. It is anticipated that this level of increase would not have a significant effect on the overall travel time or service needs for Route 7 or 908. Transit service is not anticipated to change from existing conditions based on the projected 2010 ridership data because there is available capacity on the buses currently running in the corridor.

Table 6-11 provides a summary of 2010 transit vehicle travel times as evaluated using the VISSIM software program. As shown in the table, westbound transit travel times would improve by year 2010 over existing conditions with the implementation of the Preferred Concept Plan. Eastbound travel times on both the 908 and 7, would increase with the Preferred Concept Plan. This is primarily due to the delay imposed at the roundabout, and the constrained operations through the core of the corridor (Idaho Street to Iowa Street), where only one travel lane is provided in each direction for transit vehicles and all other traffic to accommodate on-street parking.

Table 6-11
2010 With Preferred Concept Plan
Transit Travel Times (I-805 to Park Boulevard)

Route / Direction	Existing Conditions		2010 With Preferred Concept Plan		Change in Travel Time	
Route 7	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Westbound Interstate 805 to Park	8.5 min.	9.2 min.	8.5 min.	8.5 min.	0.0 min.	-0.7 min.
Eastbound Park Boulevard to	6.8 min.	9.3 min.	7.6 min.	9.8 min.	0.8 min.	0.5 min.
Route 908	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Westbound Interstate 805 to Park	7.3 min.	9.3 min.	6.9 min.	8.0 min.	-0.4 min.	-1.3 min.
Eastbound Park Boulevard to	6.6 min.	9.9 min.	7.2 min.	10.4 min.	0.6 min.	0.5 min.

6.8 Long-term (2030) With Preferred Concept Plan

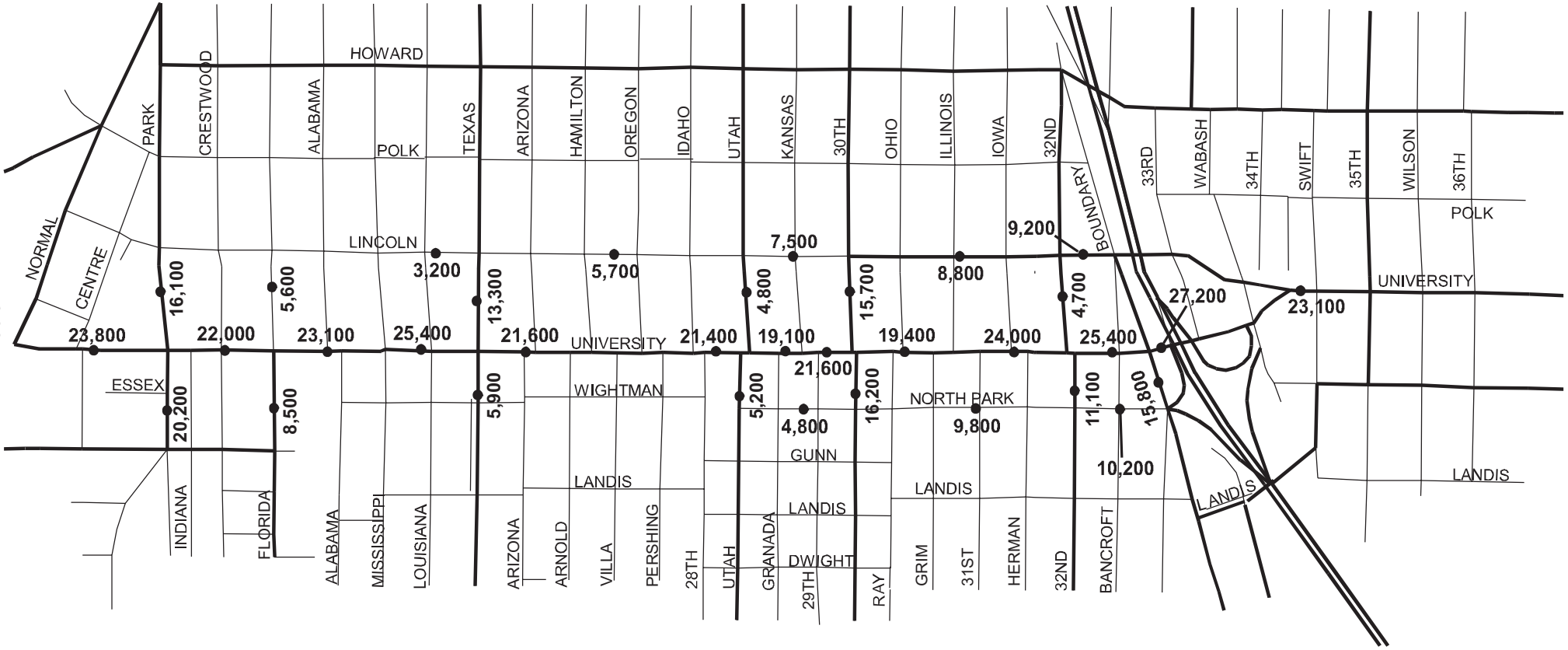
Horizon Year 2030 traffic and transit data was forecast using the SANDAG Series 10 traffic model. The changes made in the model to reflect the "With Preferred Concept Plan" scenarios are outlined herein.

Traffic

Roadway Segments

Horizon Year 2030 With Preferred Concept Plan daily traffic volumes are shown in Exhibit 6-5. To evaluate the 2030 With Preferred Concept Plan operating conditions of the roadway segments within the study area, the ADT volumes were compared to the City LOS thresholds for a two-lane Collector Roadway with a raised median and left turn pockets (Preferred Concept Plan geometry) for University Avenue from Park Boulevard to Boundary Street. No changes to capacity over existing or 2030 No Build conditions were applied to the side streets. A level of service was assigned to each roadway segment based on the level of service thresholds.

The 2030 Preferred Concept Plan roadway segment level of service analysis for the study area is summarized in Table 6-12. As shown in the table, University Avenue is expected to operate at LOS F from Park Boulevard to Wabash Avenue.



2030 WITH PREFERRED CONCEPT PLAN ADT

EXHIBIT 6-5

Table 6-12
Horizon Year 2030 With Preferred Concept Plan
Roadway Segment Level of Service Analysis

Street	Limit	2030 with Preferred Concept Plan					2030 No Build*			Change in…	
		Class (Lanes)	Capacity	ADT	LOS	V/C	ADT	LOS	V/C	ADT	V/C
University Avenue	Centre to Park	C + LTL (4)	30,000	23,800	D	0.79	**25,900**	**E**	**0.86**	-2,100	-0.07
	Park to Florida	C + RM (2)	15,000	**22,000**	**F**	**1.47**	24,100	D	0.80	-2,100	0.67
	Florida to Texas	C + RM (2)	15,000	**25,400**	**F**	**1.69**	**27,500**	**F**	**1.83**	-2,100	-0.14
	Texas to Utah	C + RM (2)	15,000	**21,600**	**F**	**1.44**	**27,400**	**F**	**1.83**	-5,800	-0.39
	Utah to 30th	C + RM (2)	15,000	**21,600**	**F**	**1.44**	**28,200**	**F**	**1.88**	-6,600	-0.44
	30th to 32nd	C + RM (2)	15,000	**24,000**	**F**	**1.60**	**30,600**	**F**	**2.55**	-6,600	-0.95
	32nd to Boundary	C + RM (2)	15,000	**25,400**	**F**	**1.69**	**31,000**	**F**	**1.03**	-5,600	0.66
	Boundary to Wabash	Collector (4)	15,000	**27,200**	**F**	**1.81**	**32,300**	**F**	**2.15**	-5,100	-0.34
Lincoln Avenue	Louisiana to Texas	Collector (2)	8,000	3,200	B	0.40	3,300	B	0.41	-100	-0.01
	Texas to Utah	Collector (2)	8,000	5,700	D	0.71	4,700	C	0.59	1,000	0.12
	Utah to 30th	C + TWLTL (2)	15,000	7,500	C	0.50	6,700	B	0.45	800	0.05
	30th to Boundary	C + TWLTL (2)	15,000	8,800	C	0.59	7,500	C	0.50	1,300	0.09
	Boundary to Wabash	C + TWLTL (2)	15,000	9,200	C	0.61	7,900	C	0.53	1,300	0.08
North Park Way	Utah to 30th	Collector (2)	8,000	4,800	C	0.60	3,300	B	0.41	1,500	0.19
	30th to 32nd	Collector (2)	8,000	**9,800**	**F**	**1.23**	**8,300**	**F**	**1.04**	1,500	0.19
	32nd to Boundary	Collector (2)	8,000	**10,200**	**F**	**1.28**	**9,700**	**F**	**1.21**	500	0.07
Park Boulevard	Lincoln to University	Major (4)	40,000	16,100	B	0.40	17,700	B	0.44	-1,600	-0.04
	University to Essex	Major (4)	40,000	20,200	B	0.51	21,000	B	0.53	-800	-0.02

Table 6-12 (continued)
Horizon Year 2030 With Preferred Concept Plan
Roadway Segment Level of Service Analysis

Street	Limit	2030 with Preferred Concept Plan					2030 No Build*			Change in…	
		Class (Lanes)	Capacity	ADT	LOS	V/C	ADT	LOS	V/C	ADT	V/C
Texas Street	Lincoln to University	C + TWLTL (2)	15,000	**13,300**	**E**	**0.89**	11,000	D	0.73	2,300	0.16
	University to Wightman	Collector (2)	8,000	5,900	D	0.74	5,000	C	0.63	900	0.11
Utah Street	Lincoln to University	Collector (2)	8,000	4,800	C	0.60	4,700	C	0.59	100	0.01
	University to North Park	Collector (2)	8,000	5,200	D	0.65	4,400	C	0.55	800	0.10
30th Street	Lincoln to University	C + TWLTL (2)	15,000	**15,700**	**F**	**1.05**	**15,700**	**F**	**1.05**	0	0.00
	University to North Park	C + TWLTL (2)	15,000	**16,200**	**F**	**1.08**	**16,200**	**F**	**1.08**	0	0.00
32nd Street	Lincoln to University	Collector (2)	8,000	4,700	C	0.59	4,700	C	0.59	0	0.00
	University to North Park	Collector (2)	8,000	**11,100**	**F**	**1.39**	**10,400**	**F**	**1.30**	700	0.09
Boundary Street	Lincoln to University	Collector (2)	8,000	2,100	A	0.26	2,100	A	0.26	0	0.00
	University to North Park	Collector (2)	8,000	**15,800**	**F**	**1.98**	**15,300**	**F**	**1.91**	500	0.07

Note: Deficient roadway segments are in bold. Bold items in 'Change in' column reflect a significant traffic impact.
C+TWLTL = Collector with Two-Way Left Turn Lane
C+LTL = Collector with Left Turn Lanes
C+RM = Collector with Raised Median
* 2030 No Build Street Classifications and Capacities are shown in Chapter 5, Table 5-4

The segment of North Park Way, from 30th Street to Boundary Street is forecast to operate at LOS F under the 2030 No Build scenario. This segment would continue to operate at LOS F with the implementation of the Preferred Concept Plan. The section of North Park Way, from Utah Street to 30th Street, is expected to go from LOS B to C under the Preferred Concept Plan.

30th Street, north and south of University Avenue, would continue to operate unacceptably with the Preferred Concept Plan. These segments would operate at LOS F in the future 2030 No Build condition and would remain at that service level. Additionally, the segments of 32nd Street, south of University Avenue, and Boundary Street, south of University Avenue, would both operate at LOS F conditions under the 2030 No Build and Preferred Concept Plan scenarios.

With the anticipated diversion of traffic off of University Avenue due to the implementation of the Concept Plan, the segment of Texas Street, north of University Avenue would expected to operate at LOS E. This segment would to operate at LOS D under the 2030 No Build scenario.

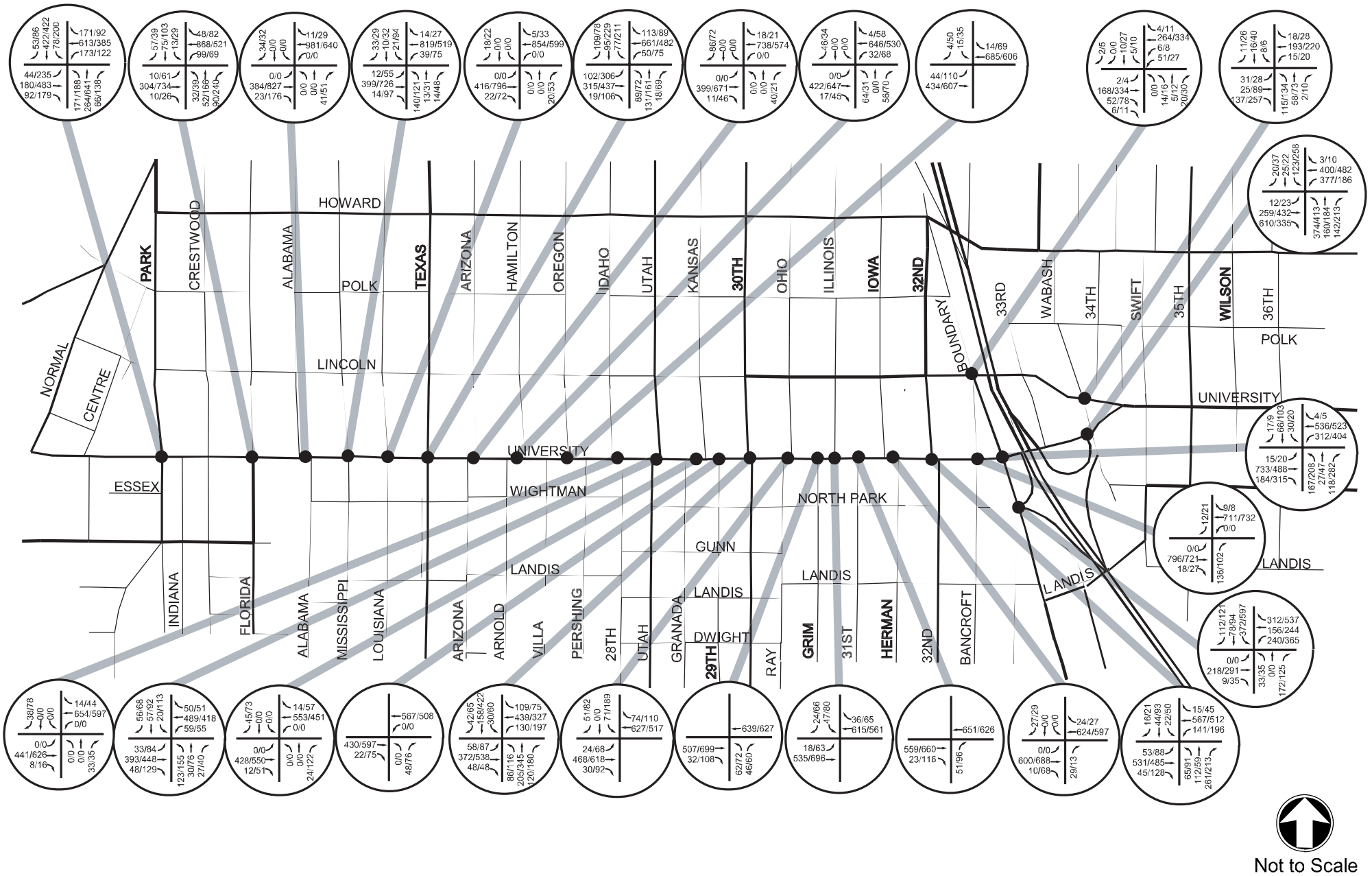
HCM Intersection Level of Service

Peak hour turning movement volumes for the Horizon Year 2030 with Preferred Concept Plan scenario were based upon the existing intersection volumes, the ADT volumes for the Preferred Concept Plan and redistribution of traffic volumes to account for the raised median along the corridor.

To begin, a growth factor was applied to each existing intersection approach volume based on the forecast increase in traffic from the existing ground count to the modeled 2030 with Preferred Concept Plan forecast. The peak hour volumes were then balanced between intersections along the entire corridor. Balancing was necessary in cases where adjacent intersection volumes were found to vary due to the applied growth factor. The lower volume approach or departure was adjusted upward to balance with the higher adjacent approach or departure.

After balancing was completed, turning movement volumes were redistributed to account for the restricted access at all unsignalized intersections due to the raised median in the Preferred Concept Plan. Peak hour traffic volumes that previously turned left from or to the unsignalized side street were reassigned to the nearest signalized intersection. U-turn movements are not currently allowed along University Avenue, nor will they be permitted in the future due to inadequate width. Therefore, it was assumed that traffic would reroute along streets parallel to University Avenue to reach their destination.

Peak hour a.m. and p.m. turning movement volumes for the Horizon Year 2030 With Preferred Concept Plan scenario are presented in Exhibit 6-6. Tables 6-13 and 6-14 present the 2030 With Preferred Concept Plan scenario levels of service at the signalized and unsignalized study intersections, respectively, based on the HCM methodology.



Not to Scale

2030 WITH PREFERRED CONCEPT PLAN PEAK HOUR VOLUME

55-100140.001 - March 2004 (2004-0331)

EXHIBIT 6-6

Table 6-13
2030 With Preferred Concept Plan
Signalized Study Intersection LOS

Study Intersection	2030 No Build		2030 With Preferred Concept Plan		Change in Delay	
	AM Delay – LOS	PM Delay – LOS	AM Delay - LOS	PM Delay – LOS	AM	PM
University Avenue/Park Boulevard	33.4 – C	**223.7 – F**	48.2 – D	**148.5 – F**	14.8	-75.2
University Avenue/Florida Street	10.0 – A	30.8 – C	16.3 – B	40.2 – D	6.3	9.4
University Avenue/Mississippi Street	9.2 – A	11.5 – B	15.3 – B	22.4 – C	6.1	10.9
University Avenue/Texas Street[1]	30.1 – C	46.8 – D	20.5 – C	**45.0 – E**	-9.6	-1.8
University Avenue/Arnold Avenue[2]	19.8 – C	**>120.0 – F**	5.8 – A	17.9 – B	-14.0	-102.1
University Avenue/Oregon Street[2]	24.6 – C	**88.9 – F**	14.0 – B	7.7 – A	-10.6	-81.2
University Avenue/Utah Street	13.0 – B	22.0 – C	20.5 – C	23.2 – C	7.5	1.2
University Avenue/30th Street	18.6 – B	**71.9 – E**	25.3 – C	**59.6 – E**	6.7	-12.3
University Avenue/Ohio Street	5.0 – A	12.2 – B	7.9 – A	10.6 – B	2.9	-1.6
University Avenue/Grim Street	3.9 – A	4.3 – A	6.3 – A	5.9 – A	2.4	1.6
University Avenue/Illinois Street	4.8 – A	7.1 – A	4.2 – A	6.0 – A	-0.6	-1.1
University Avenue/32nd Street	15.4 – B	34.9 – C	22.7 – C	29.5 – C	7.3	-5.4
University Avenue/Boundary Street	24.9 – C	**61.7 – E**	**62.7 – E**	41.1 – D	**37.8**	-20.6
University Avenue/Wabash Street	23.8 – C	**73.6 – E**	25.9 – C	32.0 – C	2.1	-41.6
Lincoln Avenue/Wabash Street	12.1 – B	13.3 – B	12.9 – B	13.0 – B	0.8	-0.3
Boundary Street/I-805 SB Ramps	16.6 – B	20.8 – C	24.8 – C	20.4 – C	8.2	-0.4

Note: Deficient intersection operation shown in bold.

[1] Roundabout under Preferred Concept Plan.

[2] Unsignalized under No Build.

Table 6-14
2030 With Preferred Concept Plan
Unsignalized Study Intersection LOS

Study Intersection	Minor Approach Delay – LOS (Overall Intersection Delay)					
	2030 No Build		2030 With Preferred Concept Plan		Change in Delay	
	AM	PM	AM	PM	AM	PM
University Avenue/Alabama Street (NB)	26.8 – D (2.2)	**>120.0 – F** (24.5)	11.4 – B (0.3)	20.2 – C (0.6)	-15.4 (1.9)	-99.8 (23.9)
University Avenue/Alabama Street (SB)	19.0 – C (0.5)	33.1 – D (0.8)	21.2 – C (0.5)	14.6 – B (0.3)	2.2 (0.0)	-18.5 (0.5)
University Avenue/Louisiana Street	26.9 – D (1.6)	**90.6 – F** (3.9)	17.7 – C (0.4)	18.1 – C (0.8)	-9.2 (1.2)	-72.5 (3.1)
University Avenue/Arizona Street (NB)	13.5 – B (0.8)	**58.8 – F** (1.2)	11.5 – B (0.4)	13.5 – B (0.2)	-2.0 (0.4)	-45.3 (1.0)
University Avenue/Arizona Street (SB)	18.6 – C (1.2)	**36.7 – E** (1.7)	21.4 – C (1.4)	15.3 – C (0.8)	2.8 (0.2)	-21.4 (0.9)
University Avenue/Arnold Street[1]	19.8 – C (1.7)	**>120.0 – F** (10.4)	-	-	-	-
University Avenue/Hamilton Street	16.2 – C (0.8)	**49.4 – E** (1.5)	18.3 – C (0.7)	15.5 – C (0.4)	2.1 (0.1)	33.9 (1.1)
University Avenue/Oregon Street[1]	24.6 – C (0.5)	**88.9 – F** (3.5)	-	-	-	-
University Avenue/Idaho Street	17.1 – C (0.8)	**40.9 – E** (2.3)	14.6 – B (0.5)	15.3 – C (0.9)	2.5 (0.3)	25.6 (1.4)
University Avenue/28th Street	15.0 – C (0.8)	26.7 – D (0.6)	12.1 – B (0.3)	16.7 – C (0.4)	-2.9 (0.5)	-10.0 (0.2)
University Avenue/Granada Street	11.4 – B (0.5)	31.3 – D (2.2)	11.7 – B (0.3)	18.3 – C (1.8)	0.3 (0.2)	-13.0 (0.4)
University Avenue/Kansas Street	16.9 – C (1.1)	**55.1 – F** (2.8)	13.8 – B (0.6)	14.0 – B (0.8)	-3.1 (0.5)	-41.1(2.0)
University Avenue/29th Street	12.4 – B (0.7)	**>120.0 – F** (7.7)	12.3 – B (0.6)	17.7 – C (1.1)	-0.1 (0.1)	-102.3(6.6)
University Avenue/31st Street	11.0 – B (0.4)	20.0 – C (0.8)	14.4 – B (0.6)	25.0 – C (1.6)	3.4 (0.2)	5.0 (0.8)
University Avenue/Iowa Street	34.1 – D (1.1)	**49.1 – E** (1.6)	15.2 – C (0.3)	14.9 – B (0.3)	-18.9 (0.8)	-34.2 (1.3)
University Avenue/Herman Avenue	11.2 – B (0.2)	14.2 – B (0.1)	14.0 – B (0.3)	16.2 – C (0.2)	2.8 (0.1)	2.0 (0.1)
University Avenue/Bancroft Street	16.2 – C (1.4)	20.9 – C (1.4)	23.1 – C (2.0)	18.4 – C (1.4)	6.9 (0.6)	-2.5 (0.0)
Boundary Street/Lincoln Avenue	13.3 – B (2.6)	10.7 – B (0.6)	15.5 – C (2.2)	21.5 – C (2.6)	2.2 (0.4)	10.8 (2.0)

Note: Deficient intersection operation shown in bold.

1 Signalized under Preferred Concept Plan conditions.

As shown in Table 6-13, in the year 2030, the intersections of University Avenue/Park Boulevard, University Avenue/30th Street, and University Avenue/Boundary Street are expected to operate at LOS E or F during one peak hour with and without the Preferred Concept Plan in place. The single-lane roundabout at Texas Street would operate at LOS E in the p.m. peak hour. Under 2030 No Build Conditions, University Avenue/Texas Street would operate at LOS D in the p.m. peak hour as a signalized intersection. Under 2030 No Build conditions, the stop-controlled approaches at Arnold Avenue and Oregon Street would operate at LOS F. With the addition of traffic signals at those locations in the Preferred Concept Plan scenario, operations would improve to LOS B or better.

Table 6-14 shows that all side street stop-controlled approaches to University Avenue would operate at acceptable LOS by the year 2030 with the Preferred Concept Plan using the HCM methodology. Because of the constrained left turn operations along the side streets, the overall level of service for the side streets improve in the Preferred Concept Plan to LOS C or better when compared to the 2030 No Build condition, based on the HCM level of service methodology. However, the HCM analysis is not capable of evaluating the interaction between intersections, since HCM is an isolated intersection analysis methodology. Due to the forecast high volume of traffic on University Avenue and the constrained capacity along the corridor, it is anticipated that queues will form along University Avenue that would affect the ability of vehicles on the side streets to access University Avenue. Such constraints were observed to occur using the VISSIM software analysis.

VISSIM Delay Summary

VISSIM was used to evaluate the 2030 With Preferred Concept Plan conditions in two capacities:

- Provide detailed travel time and delay values for the signalized intersections and the corridor as a whole.
- Visually assess the impacts to the unsignalized intersections along the corridor

Table 6-15 summarizes the results of the a.m. and p.m. peak hour delay summary for the corridor as a whole and for the individual intersections along the corridor. Table 6-16 presents the travel time and stops per vehicle data calculated by VISSIM.

The results of the VISSIM analysis demonstrate that vehicles would experience significant delay and queues at Florida Street, particularly in the p.m. peak hour. Under the Preferred Concept Plan scenario, the eastbound through lanes for mixed traffic on University Avenue are reduced from two lanes to one lane west of Florida Street, (to accommodate the eastbound transit only lane), causing a bottleneck. Similarly, in the a.m. peak hour, delay is shown to increase on the eastern portion of the corridor near Wabash Street, Boundary Street, and 32nd Street. As on the western portion of the corridor, a bottleneck is located at Boundary Street, where two mixed-flow lanes on the east side of Boundary Street are reduced down to one lane on the west side of Boundary Street to accommodate the westbound transit only lane.

Table 6-15
2030 With Preferred Concept Plan Conditions
VISSIM Measures of Effectiveness Delay Summary

Study Intersection	2030 No Build				2030 With Preferred Concept Plan				Change in Delay			
	Total Delay[1]		Concurrent Delay[2]		Total Delay[1]		Concurrent Delay[2]		Total Delay[1]		Concurrent Delay[2]	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
University Avenue/Park Avenue	33.0	113.5	32.5	111.4	33.7	144.0	29.5	166.7	0.7	30.5	-3.0	55.3
University Avenue/Florida Street	15.0	93.6	12.0	89.1	18.0	153.3	4.4	160.9	3.0	59.7	-7.6	71.8
University Avenue/Mississippi Street	9.2	68.9	7.1	70.8	13.5	56.8	6.5	58.0	4.3	-12.1	-0.6	-12.8
University Avenue/Texas Street[3]	28.4	77.1	26.3	77.3	31.9	72.3	36.7	75.2	3.5	-4.8	10.4	-2.1
University Avenue/Arnold Avenue[4]	-	-	-	-	46.7	37.2	47.0	38.4	-	-	-	-
University Avenue/Oregon Street[4]	-	-	-	-	36.1	28.1	36.0	28.0	-	-	-	-
University Avenue/Utah Street	16.5	43.1	14.6	40.9	95.2	102.1	86.4	46.2	78.7	59.0	71.8	5.3
University Avenue/30th Street	19.9	47.7	15.6	36.9	57.9	53.1	56.9	25.3	38.0	5.4	41.3	-11.6
University Avenue/Ohio Street	4.9	21.0	1.7	3.9	27.2	17.7	20.6	5.0	22.3	-3.3	18.9	1.1
University Avenue/Grim Street	5.0	6.1	3.4	3.3	12.7	8.5	9.0	4.4	7.7	2.4	5.6	1.1
University Avenue/Illinois Street	5.5	12.1	4.5	9.9	30.5	9.2	28.7	6.7	25.0	-2.9	24.2	-3.2
University Avenue/32nd Street	28.2	35.8	29.0	37.0	53.4	35.9	47.6	34.5	25.2	0.1	18.6	-2.5
University Avenue/Boundary Street	55.7	55.6	57.6	56.9	66.9	52.2	64.3	46.3	11.2	-3.4	6.7	-10.6
University Avenue/Wabash Street	37.2	35.6	33.5	33.3	53.0	26.5	50.6	25.4	15.8	-9.1	17.1	-7.9

1 Intersection Delay = Average delay for all movements at the intersection (sec/veh)
2 Concurrent Delay = Delay imposed to eastbound & westbound vehicles along University Avenue (sec/veh)
3 Roundabout in the Preferred Concept Plan
4 Traffic signal in the Preferred Concept Plan

Table 6-15 (continued)
2030 With Preferred Concept Plan Conditions
VISSIM Measures of Effectiveness Delay Summary

Study Intersection	2030 No Build				2030 With Preferred Concept Plan				Change in Delay			
	Conflicting Delay[5]		Person Delay[6]		Conflicting Delay[5]		Person Delay[6]		Conflicting Delay[5]		Person Delay[6]	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
University Avenue/Park Avenue	33.8	115.6	37.4	113.7	38.6	126.1	38.1	141.7	4.8	10.5	0.7	28.0
University Avenue/Florida Street	27.8	106.1	14.6	93.1	70.2	138.6	15.6	154.3	42.4	32.5	1.0	61.2
University Avenue/Mississippi Street	27.5	57.1	9.9	67.2	48.7	53.1	12.3	47.3	21.2	-4.0	2.4	-19.9
University Avenue/Texas Street[3]	33.6	76.6	28.7	77.9	21.3	67.7	26.3	58.9	-12.3	-8.9	-2.4	-19.0
University Avenue/Arnold Avenue[4]	-	-	-	-	44.9	24.3	33.7	27.3	-	-	-	-
University Avenue/Oregon Street[4]	-	-	-	-	37.8	29.5	26.9	21.6	-	-	-	-
University Avenue/Utah Street	26.3	53.2	18.8	45.8	122.9	244.5	96.9	87.4	96.6	191.3	78.1	41.6
University Avenue/30th Street	29.4	65.0	21.8	49.5	59.2	84.4	57.2	51.8	29.8	19.4	35.4	2.3
University Avenue/Ohio Street	5.6	10.1	4.8	19.5	59.7	49.1	27.6	15.7	54.1	39.0	22.8	-3.8
University Avenue/Grim Street	27.2	51.8	6.2	5.6	49.8	52.4	13.2	7.2	22.6	0.6	7.0	1.6
University Avenue/Illinois Street	26.6	43.7	5.7	12.0	59.4	23.5	27.0	8.6	32.8	-20.2	21.3	-3.4
University Avenue/32nd Street	24.9	29.6	28.3	36.8	66.6	39.9	48.1	33.1	41.7	10.3	19.8	-3.7
University Avenue/Boundary Street	45.6	49.7	52.6	55.4	72.8	64.4	66.7	46.2	27.2	14.7	14.1	-9.2
University Avenue/Wabash Street	42.4	40.3	37.5	36.0	55.8	27.7	55.8	27.4	13.4	-12.6	18.3	-8.6

3 Roundabout in the Preferred Concept Plan

4 Traffic signal in the Preferred Concept Plan

5 Conflicting Delay = Delay imposed to northbound & southbound vehicles entering or crossing University Avenue (sec/veh)

6 Seconds per person.

Table 6-16
2030 With Preferred Concept Plan
Travel Time / Stops (I-805 to Park Boulevard)

Direction	Travel Time						Stops[1]					
	2030 No Build		2030 With Preferred Concept Plan		Change		2030 No Build		2030 With Preferred Concept Plan		Change	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Westbound Interstate 805 to Park Boulevard	6.5	9.7	14.3	11.2	7.8	1.5	4.8	7.9	18.6	14.6	13.8	6.7
Eastbound Park Boulevard to Interstate 805	7.1	15.1	7.4	21.4	0.3	6.3	5.8	13.1	5.7	22.6	-0.1	9.5

1 Average number of stops per vehicle.

The results of the travel time analysis indicate the peak direction of travel in each peak hour would be most significantly impacted by implementation of the Preferred Concept Plan. In the a.m. peak hour, westbound passenger vehicles would take approximately 14.3 minutes to travel from Park Boulevard to Boundary Street. This is roughly 8 minutes longer than in the 2030 No Build scenario. In the p.m. peak hour, eastbound passenger vehicle travel times would be approximately 21.4 minutes to travel the corridor with the Preferred Concept Plan. This is slightly more than a 6-minute increase over the 2030 No Build scenario.

A review of the VISSIM simulation shows that the single-lane roundabout at Texas Street causes significant queuing both west and east of the intersection. In the a.m. peak hour, queuing to the east caused by the roundabout was observed to affect traffic operations at the signalized intersection of Utah Street. In the p.m. peak hour, queuing to the west caused by the roundabout was observed to affect traffic operations up to and beyond Florida Street. This results in two consecutive constraints in the eastbound direction: the reduction from two to one of mixed-flow through lane(s) west of Florida Street followed by the Texas Street roundabout.

For both the a.m. and p.m. peak hours, the delay at the Utah Street intersection is shown to increase. This is likely a combination of vehicles queuing back from the Texas Street roundabout and the all-pedestrian phase at the Utah Street intersection.

An additional constraint observed in the VISSIM simulation affecting both directions of travel is the combined mixed-flow/transit lane portion of University Avenue between Idaho Street and Iowa Street. In this section, passenger and transit vehicles are required to merge from two lanes into one lane at points where the transit-only lane feeds into the mixed-flow lane and at transit stops. As stated previously in the HCM analysis section, the HCM methodology does not consider the effect of queuing at nearby adjacent intersections. Review of the simulation indicates that performing a right turn out of a stop-controlled

intersection would be difficult with a steady stream of traffic in the single mixed-flow lane and/or a standing queue.

Transit

Travel Time

Travel time is the greatest measure of transit effectiveness. One of the primary purposes of the Preferred Concept Plan was to provide an enhanced level of transit service within the project study area. Improving the travel time through the corridor makes transit a more viable and possibly preferred choice for mobility. Under the year 2030 Preferred Concept Plan scenario, the following is a summary of the transit travel times for the a.m. and p.m. peak periods for Routes 7 and 908, based on the travel time summary provided in Table 6-17:

- **P.M. Eastbound**: This time period and direction have typically been the most difficult for both the 7 and 908. For both Route 7 and 908 with the Preferred Concept Plan there would be approximately a two and a half (2.5) minute or a 15 percent improvement over the 2030 No Build scenario.

- **P.M. Westbound**: Both the 7 and 908 would experience approximately a five (5) minute or 60 percent savings over the 2030 No Build scenario

- **A.M. Eastbound**: Both the 7 and the 908 would experience an approximate four (4) minute improvement with the Preferred Concept. The time savings is in the realm of 40 percent.

- **A.M. Westbound**: The 7 and the 908 would experience an increase in travel time over the 2030 No Build scenario. The increase would be 1.5 minutes for Route 7 and 3.3 minutes for Route, primarily due to the on street parallel parking on University Avenue.

Table 6-17
2030 With Preferred Concept Plan
Transit Travel Times (I-805 to Park Boulevard)

Route / Direction	2030 No Build		2030 With Preferred Concept Plan		Change in Travel Time	
Route 7	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Westbound Interstate 805 to Park	10.4 min.	12.3 min.	11.9 min.	7.2 min.	1.5 min.	-5.1 min.
Eastbound Park Boulevard to Interstate 805	8.8 min.	17.8 min.	5.1 min.	15.3 min.	-3.7 min.	-2.5 min.
Route 908	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Westbound Interstate 805 to Park	8.8 min.	11.8 min.	12.1 min.	7.2 min.	3.3 min.	-4.6 min.
Eastbound Park Boulevard to Interstate 805	8.3 min.	17.9 min.	4.2 min.	15.3 min.	-3.9 min.	-2.6 min.

On-Time Performance

It is difficult to determine if a new improvement to a local service, not yet in operation, would be able to maintain a high level of on-time performance. Until the service has been in operation for a period of time it's not possible to determine the route's ability to maintain its on-time performance.

The best way to determine the value of a new service (with the Preferred Concept Plan's transit priority measures this really could be considered a "new" route) is to run a micro-simulation model, such as VISSIM, to determine if travel times can be improved. As stated above the Route 7 and Route 908 experience improvements in travel time except for the westbound AM which has an increase in travel time.

It would be fair to assume that if a decrease in travel time is possible, based on the Preferred Concept Plan, then future on-time performance will be improved as well. This, of course, is not the case for the a.m. westbound, which is demonstrating an increase of travel time for this period.

Transit Passenger Accessibility

Even with the reduced number of transit stops (from 20 to 10) passenger accessibility would continue to remaining very good. With current stops within approximately 350-feet of each other, there is no balance between access convenience, and speed of service. Reducing the stops from 20 to 10 would create an average spacing of approximately 1,300 linear feet. This would provide a halfway distance between stops of 650-feet. This consolidation of the stops begins to restore a balance between access and speed or

reliability for on time performance in the Preferred Concept Plan. Also, the new stop locations are placed near activity centers and continue to be at major transfer centers.

Transit Performance Based on Preferred Concept Plan

The transit performance in the Preferred Concept Plan scenario shows an improvement over the 2030 No Build scenario in three (3) of the four (4) time periods as shown in Table 6-17. Although the 7 to 23 percent savings in time performance is better than the "No Build" it would not be considered significant for the rate since it is experienced for a travel length of 1.9 miles out of a total of 12.6 miles. The vast majority of passengers boarding or alighting in the study area are traveling outside of the corridor. So, the overall travel time savings for these passengers would be, as a percentage of their overall travel time, even less.

The a.m. westbound increase in travel time is highly undesirable. SANDAG/MTS would not want to see improvements implemented that actually increased the transit travel time during peak periods. Even though there are dedicated transit lanes in the Preferred Concept Plan, the need to transition into the mixed flow travel lanes impacts the free flowing movement of transit vehicles. There would be no incentive for SANDAG/MTS to see these westbound improvements implemented. The improvements should be designed to improve service reliability and performance, not restrict it.

The transit travel time results demonstrate that the combined benefits of dedicated transit only lanes, queue jumping lanes, transit signal priority, and reducing stops led to a net travel time savings of 7 to 23 percent savings in three (3) of the four (4) time periods. If the fourth time period could show similar improvements of reduced running times there may be merit in implementing the Preferred Concept Plan measures. Additionally, it should be noted that if similar transit priority measures could be implemented in other segments of Routes 7 and 908 additional time savings, and therefore increased transit performance, could be achieved. If the transit performance could reach a 25 to 30 percent time savings over the "No Build" conditions for the entire length of either route it would be considered a substantial improvement.

Pedestrians and Transit

Pedestrian Movements on Transit Effectiveness

The purpose of this section is to document the transit passenger and pedestrian activity patterns along University Avenue and the perpendicular streets leading to the transit stops. This information will be used to reach the following objectives:

- To define the pedestrian movements to the existing transit stops and to confirm the streets that provide a logical access to the proposed transit stops identified in the Preferred Concept Plan.

- To provide recommendations of possible improvements to the environments along the major streets used to reach the future stops. (Chapter 8)

- To confirm the location of the mid-block unsignalized crossing and its relationship to the future transit stop locations.

- To confirm existing and future land use patterns along the study corridor.

- To determine if any delays to the transit operations might occur based on future pedestrian patterns or movements uncovered in this analysis.

- To make a final recommendation on the proposed stop locations, or relocations, based on the above information.

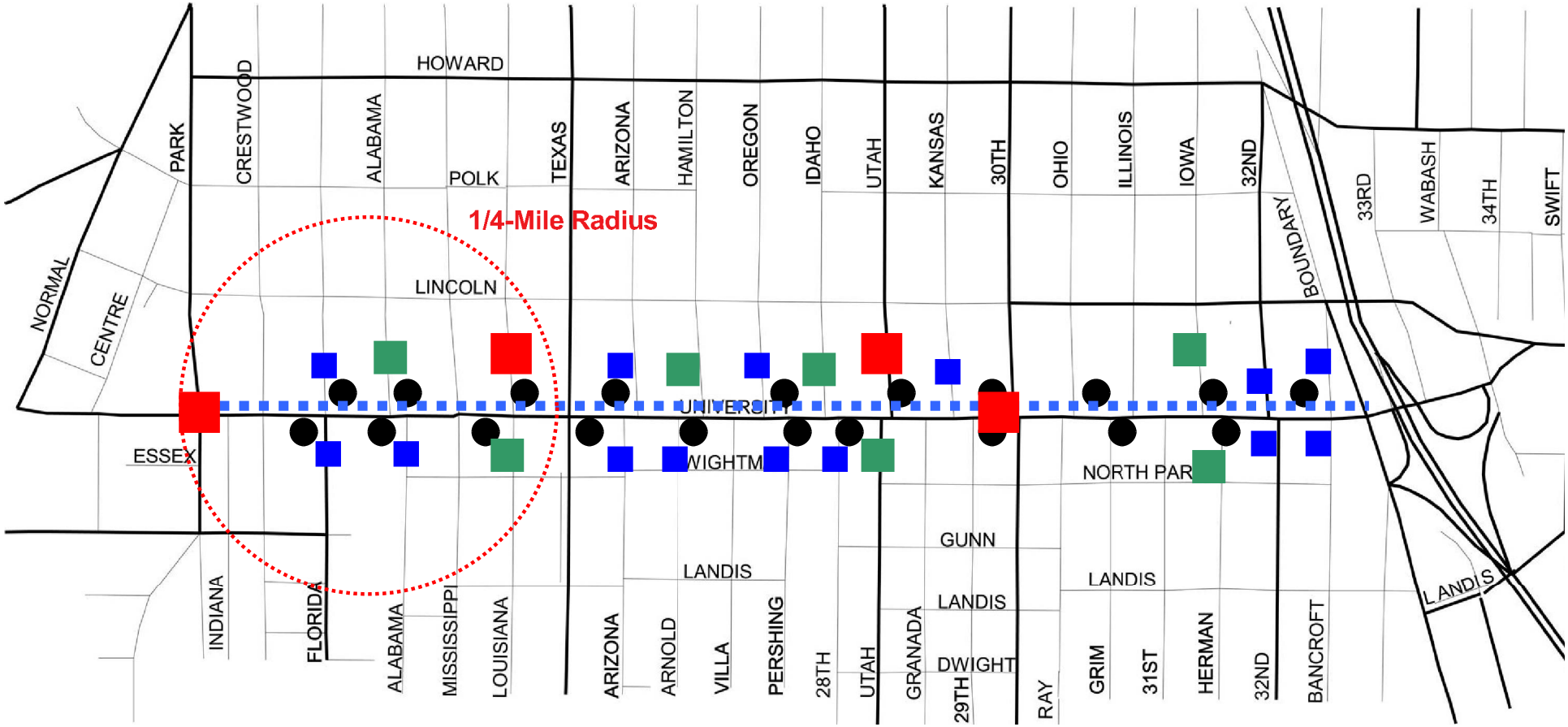
Pedestrian Movement at Existing Transit Stops

All transit patrons at some point in their journey are pedestrians. Therefore, as a general rule, transit stops should be connected to the surrounding neighborhoods with direct, safe, pleasant and convenient pedestrian access. Additionally, research has indicated that transit stops located near empty lots, vacated or dilapidated buildings, mid-block alleys, and certain types of land uses, tend to have higher incidents of crime. The relocation of the transit stops along University Avenue addresses this issue by placing stops away from such areas. Such planning is a good starting point for increasing the potential for additional transit passengers.

An analysis of the pedestrian movements from the surrounding neighborhoods and a determination of how they reached the existing transit stops on University Avenue was completed during peak transit periods. This involved on-site investigations into the current pedestrian movement to the transit stops, especially the stops with high boarding and alighting activity. The boarding and alighting figures were based on SANDAG's ridership model data for the Routes 7 and 908 transit lines.

This type of pedestrian movement was then related to the proposed transit stops, in the Preferred Concept Plan, to establish which streets should receive enhanced treatment for improved pedestrian experience and a potential increase in access from the surrounding neighborhoods under the Preferred Concept Plan. The existing stops on University Avenue are discussed below, with a diagrammatic summary provided in Exhibit 6-7.

- **Bancroft Street Stop.** The Bancroft Street Stop is one of the least used stops in the corridor. It was observed that passengers arrive at the stop primarily from the north side of University Avenue, from either Boundary or Bancroft Street.



Route 7 and 908: 20-Transit Stops on University Avenue

Primary Pedestrian Path to Transit Stop

Secondary Pedestrian Path to Transit Stop

Minor Pedestrian Path to Transit

Transit Route

Not to Scale

PEDESTRIAN CIRCULATION PATTERN TO EXISTING TRANSIT STOPS

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EXHIBIT 6-7

- **Iowa Street / Herman Street Stops.** The Iowa Street stop, serving westbound passengers, is also a less frequently used stop. While the Herman Street stop, which serves the eastbound passengers, has a higher passenger count. Many of the passengers using these stops appeared to be elderly and/or disabled. These passengers were coming from a senior housing project south of University on Herman Street and North Park Way. To reach the Iowa Street stop these pedestrians were crossing at mid-block and were not using the signalized intersection one block west at 32nd Street. Both stops remain in the Preferred Concept Plan.

  Transit passengers were also observed to arrive from Iowa Street to access the Iowa Street stop directly from the north. Other passengers were observed to arrive either north or south from 32nd street, using University Avenue to access the stop. However, these passengers were in the minority.

- **Illinois Street/ Grim Street Stops.** Transit passengers were noted to arrive at the stop primarily from University Avenue. Few of the transit passengers arrived directly from Illinois Street or Grim Street. These two stops are among the least used stops in the corridor.

  In the Preferred Concept Plan, both stops are eliminated. The next closest station would be located at Iowa Street serving westbound passengers, and at 30th Street serving eastbound passengers.

- **30th Street Stops.** This transit stop/intersection is extremely busy with very high boarding and alighting occurrences. The majority of the transit passengers at this stop are transfers from the northbound and southbound Routes 2 and 6. Most of the pedestrian activity occurs right at the intersection, and does not filter north or south on 30th Street. A few transit passengers arrived at the stop from 30th Street, Ray Street, and Kansas Street. However, most of the transit passengers stayed within the intersection. It was observed that very light pedestrian movement filtered into the surrounding neighborhoods.

  The Preferred Concept Plan would keep the 30th Street stops. The eastbound station would be relocated to the east side of 30th Street as a far side stop. Based on the high level of passengers at this location, it would be advisable to improve the pedestrian area wherever possible. A possible location for pedestrian improvements is the southeast corner of

University Avenue and 30th Street at the proposed eastbound stop location. The Preferred Concept Plan provides a transit pull-in for the stop. Creating a transit stop "in-street" would allow for the proposed transit pull-in area reverting to increased pedestrian space, improving this crowed area.

- **Utah Street Stops.** At Utah Street, the stops serve both the westbound and eastbound passengers and both are moderately high locations for boarding and alighting. The passengers arrive primarily from both north and south of University Avenue. The second highest number of passengers arrived from Kansas Street, with a very small percentage arriving from Granada Street. It was noted that a few of the passengers alighting were students/parents headed for Jefferson Elementary School.

  In the Preferred Concept Plan the Utah Street stops are eliminated. The closest stations would be located at Idaho Street. This location would serve both westbound and eastbound passengers.

- **Oregon Street / Pershing Avenue Stop.** The Oregon Street stop, serving westbound passengers, and the Pershing Avenue stop, serving eastbound passengers are both lightly used stops based on the boarding and alighting figures from SANDAG. The passengers were observed to be arriving primarily from Oregon Street, with a small percentage of passengers arriving from Pershing Avenue. The second largest number of passengers arrived from the west on University Avenue.

  In the Preferred Concept Plan, the Oregon Street stop is eliminated, while the Pershing Avenue stop remains, serving eastbound passengers. The next closest station for westbound passengers is located at Idaho Street.

- **Arizona Street / Arnold Avenue Stop.** The Arizona Street stop had few passengers. Most of the passengers were observed to arrive from Hamilton Street, while others were arriving from either east or west on University Avenue.

  In the Preferred Concept Plan, both the Arizona Street and Arnold Avenue stops are eliminated. The next closest station serving westbound passengers is located on the west side of Texas Street. The stop location serving the eastbound passengers is between Texas Street and Arizona Street. Both are located on the far side of the proposed roundabout at Texas Street.

- **Louisiana Street Stop.** In general, the transit stops at Louisiana Street have a high level of passenger activity. The majority of the passengers were observed either arriving or leaving

both north and south on Louisiana Street. Others arrived from east or west on University Avenue.

The Louisiana Street stops (both westbound and eastbound) are eliminated in the Preferred Concept Plan and transit passengers would use the new Texas Street locations. Based on the high level of passengers arriving from Louisiana Street and also going to the Albertson's grocery store it might be beneficial to reconsider maintaining the Louisiana Street eastbound station. However, for this study the stations should be eliminated to maintain SANDAG's stop distance recommendations and to allow this analysis to fully understand the impact of consolidating the existing stations to ten (10) as defined by the Preferred Concept Plan. As the project moves forward into the next phase the eastbound station should re-examine by the community and SANDAG to determine if it continues to warrant removal or if it should stay.

- **Alabama Street Stop.** The number of passengers using the Alabama Street stop was less than those using the Louisiana Street stop. During the peak period, most of the passengers arrived and departed to and from Alabama Street. Very few passengers arrived from University Avenue.

  The Preferred Concept Plan retains both the Alabama Street stops, but places the stops at far side locations.

- **Florida Street Stop.** The passengers arriving at the Florida Street stop arrive primarily from the north on Florida Street, while a very small percentage arrive from the south.

  The Preferred Concept Plan eliminates the Florida Street stop. The next closest stop would be at Alabama Street.

- **Park Boulevard Stop.** Park Boulevard is a major transit hub. Like 30th Street and University Avenue, this intersection has multiple transit lines coming into it. When reviewing the pedestrian patterns it was observed that the majority of the transit patrons were transferring to other buses. A small portion of the passengers arrived by either Park Boulevard or University Avenue. This stop/intersection is extremely busy with a very high boarding and alighting occurring at peak periods. However, most of the transit passengers moved within the intersection to close by stops, with very few of the pedestrians filtering into the surrounding neighborhoods.

To provide a safe, pedestrian friendly environment from the side streets to University Avenue, several improvement corridors along the side streets have been identified. The intent is to ensure improved pedestrian connectivity to the proposed transit stops noted in the Preferred Concept Plan. Not all

proposed improvements are located on streets that connect directly with a transit stop. Some locations provide connections with the nearest pedestrian crossing or signalized intersection. The goal is to provide pedestrian friendly connectivity to the transit corridor and to the transit stops.

Based on the above analysis, the following selected streets are recommended for pedestrian improvements.

North of University Avenue

- Iowa Street
- Utah Street
- Idaho Street
- Arizona Street
- Louisiana Street
- Alabama Street

South of University Avenue

- Herman Street
- 30th Street Utah Street
- Pershing Avenue
- Arizona Street
- Louisiana Street
- Alabama Street

Recommended improvements are outlined in Chapter 8.

Pedestrian Movement Analysis at Unsignalized Crosswalk Locations (LED Flashers)

An analysis was conducted on the pedestrian movement at key intersections and at the unsignalized locations identified in the Preferred Concept Plan. How these movements might affect transit ridership and service was considered important to the overall success of the transit mobility for the corridor.

This effort included reviewing the following pedestrian information: SANDAG transit boarding and alighting information, Counts Unlimited pedestrian counts, and on-site field observations. This information was provided for the traffic/transit modeling effort used to determine the travel time for all vehicles at peak periods for the project study area.

In general it should be noted that the Preferred Concept Plan design and subsequent modeling efforts showed that the unsignalized pedestrian crossings do not significantly impact the flow of traffic or transit. The unsignalized pedestrian crossing locations are:

- **Alabama Street.** The Preferred Concept Plan has identified Alabama Street as having two of the ten transit stops serving both westbound and eastbound transit vehicles. At this location the Preferred Concept Plan has a flashing light and lighted cross walk with in-pavement light emitting diode (LED) flashers. This is an appropriate treatment given the volume of transit passengers crossing at this intersection. The number of pedestrians crossing at this location during peak periods was noted as "High", indicating more than 200 pedestrian crossings per day. However, the number of pedestrians crossing would not affect peak period transit operations. Of those crossing University Avenue (approximately 20 during a.m. peak period and 57 during p.m. peak), the majority of the transit passenger crossings occurred prior to the arrival of the transit vehicles. Other pedestrian crossings at this location were considered very light.

  At peak periods with transit vehicles running every 6 minutes, the pedestrian activation of the signal crossing would not have a significant impact to operational headways. It should be noted that there are other issues hindering the operational efficiency in the corridor. Most notably, the merge movement required in the Preferred Concept Plan to transition to mixed-flow lanes for transit vehicles. Given the current lane configuration, the unsignalized pedestrian crossing at Alabama Street will have little or no impact on transit operations.

- **Texas Street.** Texas Street has two of the ten transit stops serving the corridor. Both occur as far side serving stops on University Avenue. At this location the Preferred Concept Plan has a flashing light and lighted cross walk or in pavement LED flashers for all crossings at the Roundabout. This would be an appropriate location given the volume of transit passengers that would be potentially crossing at this intersection. However, the crossings that would be of concern are those located on University Avenue. The number of pedestrians crossing University Avenue during a.m. peak period is 23, while the p.m. peak period was 26. This volume of crossings would not affect peak period transit operations.

  With transit vehicles running every 6 minutes, the pedestrian activation of the pedestrian crossing warning would not have a significant impact to operational headways at this location. The unsignalized pedestrian crossing would have no significant impact to the travel times within the corridor. There are larger issues hindering the operational efficiency at the Roundabout. This is primarily the merge movement required in the Preferred Concept Plan of transitioning to from two lanes to a single lane roundabout.

- **Idaho Street.** The Preferred Concept Plan has identified Idaho Street as one of the five transit stops serving the westbound transit vehicles. The eastbound transit stop is closer to Pershing Avenue and will benefit from the signalized intersection at Oregon Street. At the Idaho Street location there will be a flashing light and lighted cross walk or in pavement LED

flashers. This appears to be an appropriate treatment given that it is associated with the transit stop.

However, the existing pedestrian crossings are very light with only 30 crossings during both the AM and PM peak period. Again, the majority of the transit passenger crossings occurred well in advance of the arriving transit vehicles. Additionally, the transit patrons alighting at these locations cross University Avenue after the transit vehicles have departed. With transit vehicles running every 6 minutes, the pedestrian activation of the signal crossing does not have a significant impact to operational headways.

- **Kansas Street/ 29th Street.** Kansas Street is the first block to the west of the 30th Street transit stop and the Preferred Concept Plan has identified an unsignalized crossing at this location. The pedestrian crossing activity at this location on University Avenue was very light with only three crossings observed for both the AM and PM peak periods. But it should also be noted that the crossings at 29th Street were extremely high, with over a 120 crossings in the AM and PM peak periods. Pedestrian activation of the enhanced pedestrian crossing would have a very minor impact to transit vehicles operational headways with this current threshold. However, future conditions at this location may change with the opening of the North Park Theater and the proposed parking structure at 29th Street and North Park Way.

- **Iowa Street/Herman Street.** The Preferred Concept Plan has identified Iowa Street as one (1) of the five (5) transit stops serving the westbound transit vehicles. It was noted that the primary pedestrian crossings occurred on the west side of Iowa Street across University Avenue with 13 crossings occurring in the a.m. and p.m. peak periods. The east side of Iowa Street was noted to have only five (5) during the same time period. This low amount of pedestrian crossings at University Avenue would not have an impact on the transit operational modeling.

Proposed Transit Stop Locations and Passenger Redistribution

The Traffic Calming Conceptual Study determined that the number of stops along the University Avenue corridor between Park Boulevard and Boundary Street were extensive and could potentially cause slower operational times for both the 908 and 7 routes. The Preferred Concept Plan proposed fewer transit stop locations (10 vs. 20 existing) to improve transit's operational times. SANDAG typically realizes a 15 second gain in travel time for every stop that is consolidated.

The rationale used for locating these new stops was to:

- Increase the stop distances from 1-2 blocks to a minimum of every 3-blocks.

- Anchor new transit stops with major destinations or transfer locations such as 30th Street/University Avenue and Park Boulevard/University Avenue.

- Provide the consolidated stops with regard to existing senior facilities and in consideration of the existing topography.

Again, the primary reason for reducing the number of stops is to increase the time and efficiency of the transit service along this corridor. To determine if there would be a benefit in reducing the number of stops, a traffic/transit model was run. As part of the model's program a new assignment of the passengers allocated for each of the new stops was needed. This passenger allocation provided the estimated dwell time for each stop. The dwell time is an important component of the transit model as it provides the length of time the transit vehicle is stopped for the boarding and aligning of passengers. A redistribution of the passengers was prepared based on the new stop locations. This redistribution of the passengers basically shifted the passengers from a deleted stop to the closest stop to the east and to the west. Typically half of the passengers were shifted to the nearest eastern and western stop to account for the deleted station. The results of this passenger redistribution are illustrated in Table 6-1, provided previously in this chapter.

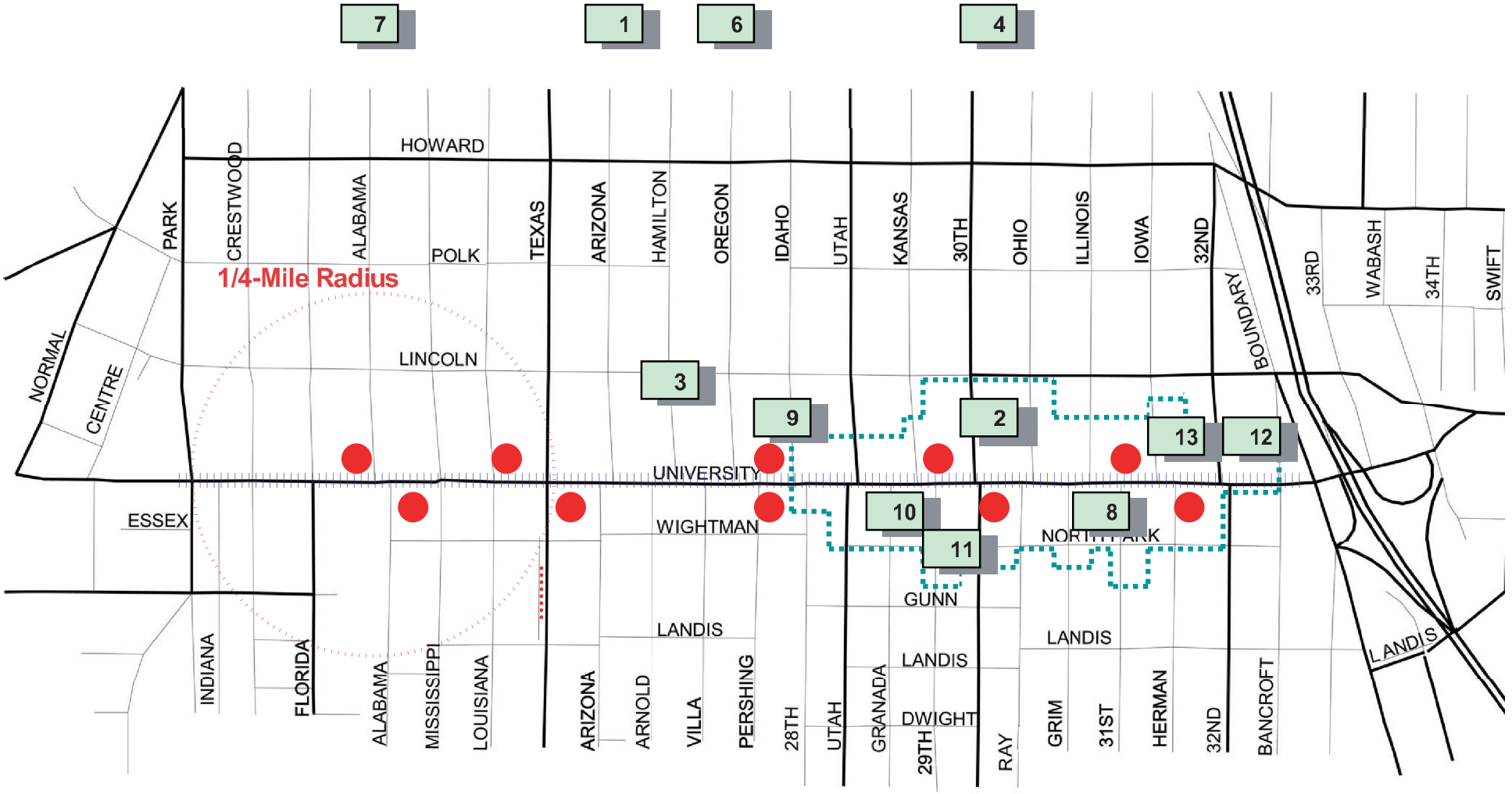
With this new passenger redistribution the dwell times were recalculated to account for the new passenger boarding and alighting times and are included in the new overall travel times for Route 7 and 908. The dwell times are noted in Table 6-2, provided previously in this chapter.

Review Land Use Patterns – Existing and Future

A review of the existing and proposed activity centers, as well as future development patterns (SANDAG's 2030 projections), within a 1/4-mile of the corridor was conducted. This land use study was used to help refine, if necessary, the locations of the transit stops. The intent is to pair the proposed transit stops with areas of increase densities and mix of land uses.

In discussions with the City of San Diego's Long Range Planning Division, numerous projects in North Park are currently approved or proposed within close proximity to University Avenue. A summary of these projects is listed in Table 6-18 and their locations are illustrated in Exhibit 6-8. These projects are all within close proximity to a proposed transit stop.

Additionally, North Park is one of the City of San Diego's "City of Villages" Pilot Villages. The "village" is located in the North Park redevelopment area centered on 30th and University Avenue. The purpose of the pilot project is to demonstrate how the "Villages" can revitalize existing neighborhoods while retaining their individual character. It is anticipated that additional projects will occur within the redevelopment area and rely on the transit system for part of their transportation needs. The Pilot Village Area is also outlined in Exhibit 6- 8.



6-56

PROPOSED PROJECTS IN NORTH PARK

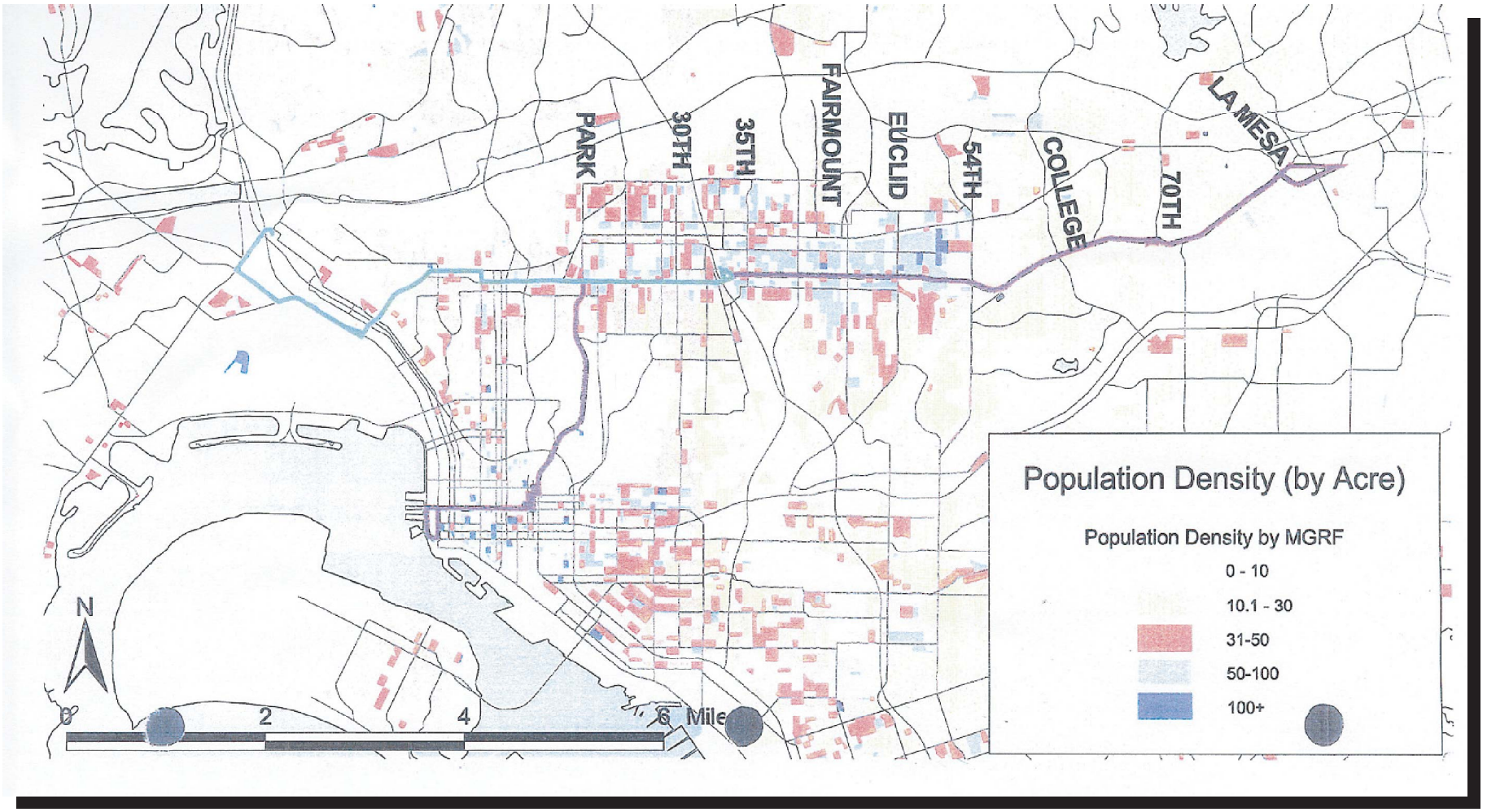
55-100140.001 - March 2004 (2004-0331)

EXHIBIT 6-8

Table 6-18
Land Use Summary Table

Project Name	# of Units	Location	Status	Mixed-Use
Hamilton Rowhomes	4	4566 Hamilton Street	Approved	No
North Park Condos	224	Lincoln Between Ohio/30th	Approved by Planning Commission	Yes
Hamilton Street Condos	16	Hamilton/Lincoln	Approved	No
Renaissance	134	30th/El Cajon Boulevard	In Construction	Yes
30th and Upas	TBD	3409 30th Street	Proposed	Yes
La Fayette Hotel	+/- 250	El Cajon Boulevard	Proposed	Yes
Alabama/ECB	94	Alabama/El Cajon	Proposed	Yes
Verso (Potential Library site)	150	31st/University	Proposed	Yes
Deaf Services/Library/ Residential	88	Idaho/University	Proposed	Yes
North Park Theater	-	29th/University Avenue	In Construction	No
North Park Theater Parking Structure	-	30th/North Park Way	Approved	Yes
Walgreen's	-	32nd /University	Approved	Yes
Walgreen's Parking Structure	-	32nd/University	Approved	No

SANDAG has determined that by 2030, the North Park area will see an increase in density. This is based on SANDAG's Series 10 socioeconomic forecast model and reflects preliminary assumptions concerning SANDAG's regional vision. In general, SANDAG's model illustrates that the majority of the growth within the North Park area will occur north of University Avenue and south of Adams Avenue. The area south of University Avenue is shown as not having any appreciable increase in growth. The difference in the population density from the year 2000 to 2030 can be seen in Exhibits 6-9 and 6-10. Additionally, the employment densities anticipated for the North Park community does not change significantly between 2000 and 2003. This can be seen in Exhibits 6-11 and 6-12. Based on this land use information, the location and placement of the proposed transit stops serving the University Avenue corridor still appear to be appropriate.



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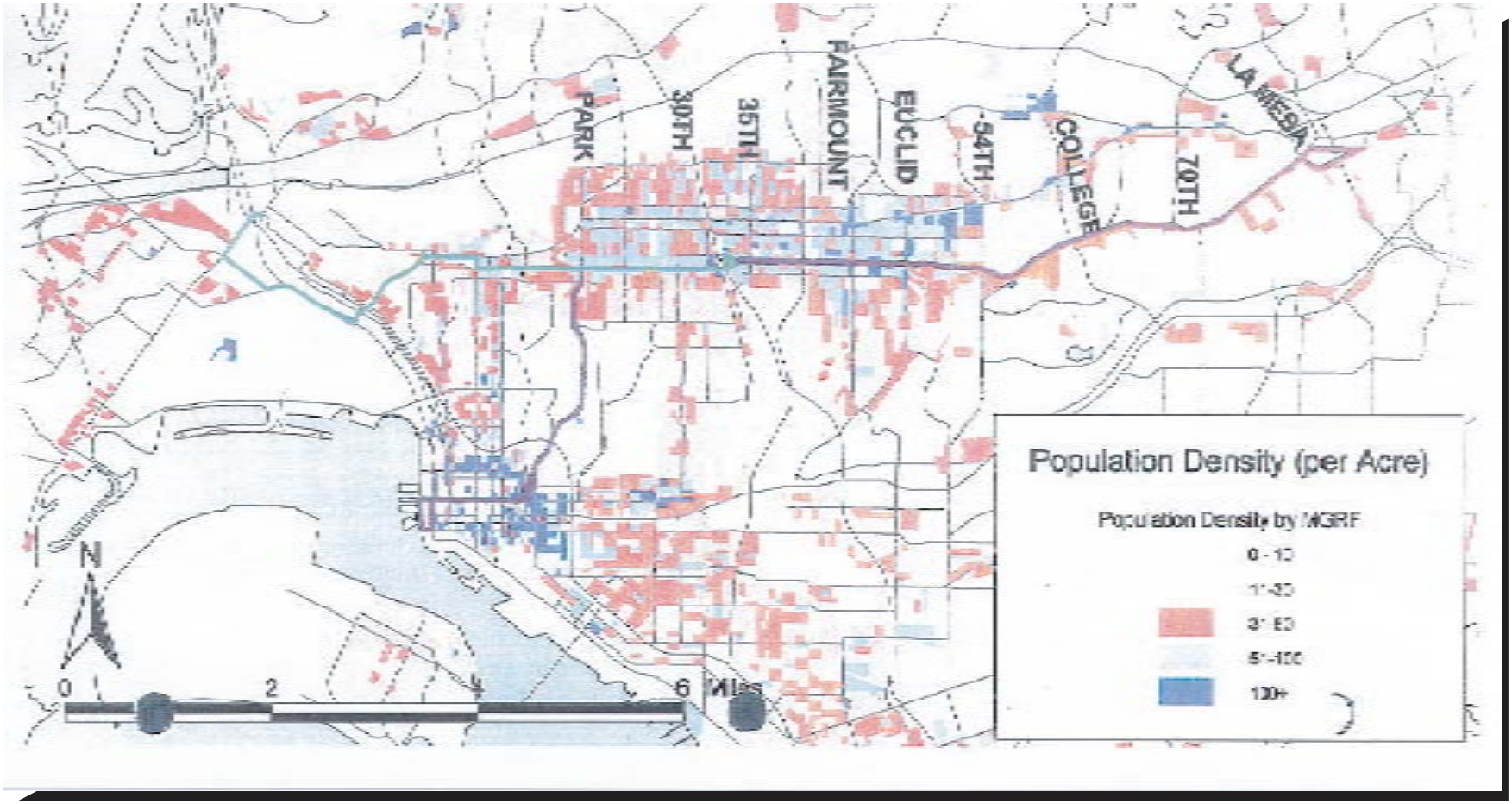
2000 POPULATION DENSITY



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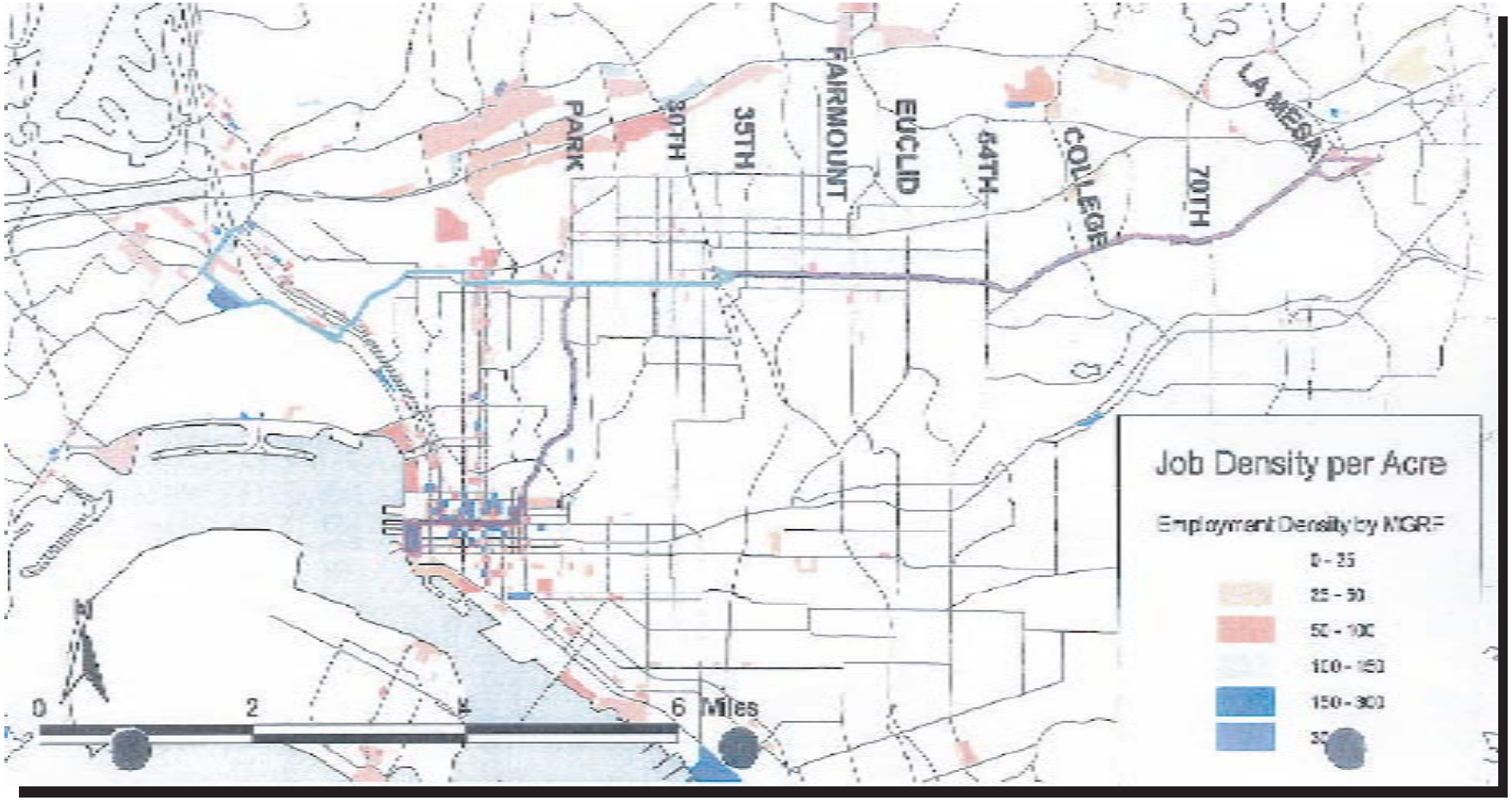
2030 POPULATION DENSITY

EXHIBIT 6-10



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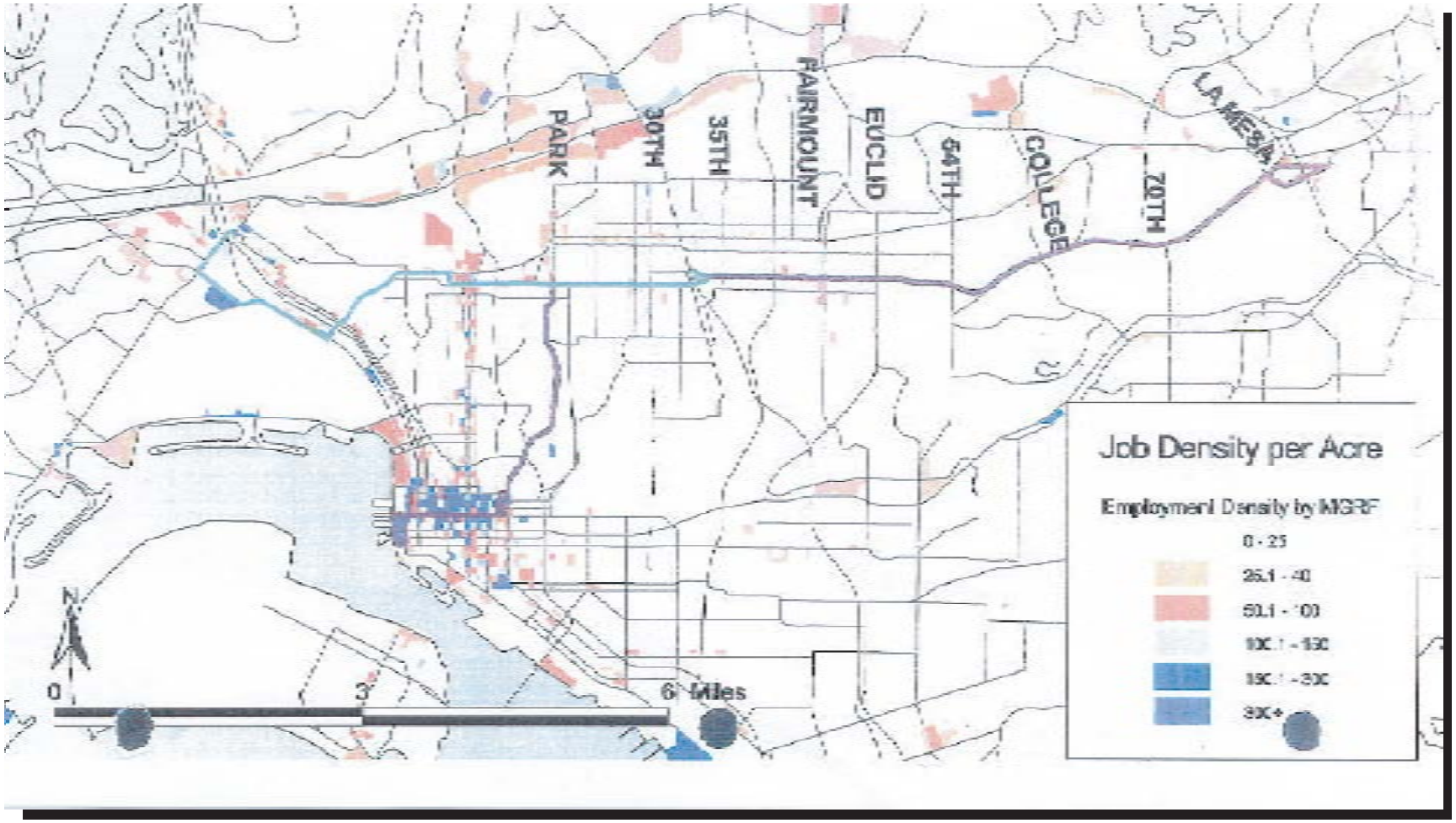
2000 EMPLOYMENT DENSITY



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2030 EMPLOYMENT DENSITY

6.9 IDENTIFICATION OF CORRIDOR CONSTRAINTS WITH PREFERRED CONCEPT PLAN

Four main constraints to providing efficient operations along University Avenue were identified that are inherent to the Preferred Concept Plan:

- **Single Lane Roundabout at Texas Street** – The forecast traffic volumes at this intersection exceed the capacity of a single lane roundabout, which would lead to queues east and west of Texas Street that could affect upstream signalized and unsignalized intersections.

- **Discontinuous Transit Only Lane** – The transit only lane is discontinuous in several locations along the corridor. To meet the objective of providing efficient transit service along the corridor, it would be beneficial to reduce the number of merging maneuvers required by the transit vehicles. This could be achieved by maximizing the length of the transit only lane.

- **Parallel Parking** – The transit only lane is discontinuous due to the on-street parallel parking along University Avenue. This parallel parking aims to provide loading and unloading as well as storefront parking for many businesses fronting University Avenue. To maintain the on street parking, only one lane in each direction could be provided for traffic along University Avenue. This mixed flow lane would, of necessity, include passenger vehicles and transit vehicles. The merging and weaving required of transit vehicles and passenger vehicles through this portion of the corridor results in lengthy queues and delays.

- **Effectiveness of Queue Jumping Lanes** – Queue jumper lanes are intended to give buses a head start when they are stopped at a traffic light. However, the forecast queues along University Avenue between blocks observed with the VISSIM simulation program, show that the queue jumpers are not effective. Basically, buses would move from the stoplight to the end of the queue at the next adjacent intersection. Transit signal priority of a dedicated transit only lane would provide significantly better operations for transit vehicles.

These constraints were presented to the public at the March 20th Community Workshop held at the Claire de Lune Cafe. At that time, potential solutions for resolving these operational issues were also presented, which included:

- Maintain Signal Operations at Texas Street
- Relocate On-Street Parallel Parking
- Replace Queue Jump Technology with Transit Signal Priority

Chapter 7 discusses the alternatives evaluated to improve the overall operations of the corridor and to find a balance for vehicular, transit, bicycles, and pedestrian mobility through North Park.